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THE SASKATCHEWAN SYSTEM OF RURAL LAND ASSESSMENT[1]

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Introducing the subject "The Saskatchewan System of Rural Land Assessment" it might be interesting and equally informative to refer briefly to the assessment history of the Province of Saskatchewan. This illustrates clearly the urgent need for a complete re-assessment of all rural lands in this province.

Saskatchewan took its place officially as a unit of Confederation in the year 1905, and at that time municipal organizations consisted of two forms only, namely, towns and rural municipalities. These were governed by a municipal ordinance which was a part of the general ordinances of the North West Territories of Canada. The only provisions made with reference to the method of assessment were contained in Section 127 of the Statutes of Saskatchewan, which read as follows:—

> "In assessing vacant ground or ground used as a farm, the value of each parcel shall be that at which sales of it can be reasonably expected during the current year."

No method or guide was given as to how such assessment was to be made and consequently it was not used as a means or base for levying taxes. Instead, a flat rate of not more than $6\frac{1}{4}$ cents per acre was set and used exclusively.

In 1912–13 provision was made by statute for assessment of land as follows:—

> *Sec. 252A:*—"Land shall be assessed at its actual cash value exclusive of any increase in such value caused by the erection of any building thereon or by any other expenditure of labour or capital."

Assessment value now became the base for the levying of taxes on rural land.

In 1916 provision was first made for the levying of the patriotic tax at a rate of one mill on the dollar of assessment value. This rate was subsequently raised to two mills, and while the name has been changed from "Patriotic Tax" to "Public Revenue Tax" the rate of two mills on the dollar of assessment value is still in force as at this date.

In the year 1917 the Legislature of the Province of Saskatchewan enacted that each and every rural municipality make a return to the Wild Land Tax Commissioner. The said Commissioner, in turn, had the

[1] Address delivered before the Twelfth Annual Meeting of the Canadian Agricultural Economics Society at the University of Manitoba, Winnipeg, Man., June 20–21, 1940, held in conjunction with the Twentieth Annual Meeting of the Canadian Society of Technical Agriculturists.

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authority to demand that the assessment of any rural municipality be lowered or increased for the next year following. This was the first step towards equalization of farm land assessment as between rural municipalities and was instituted to make more equitable the levying of the patriotic tax.

Again, in the year 1920, when the statutes of the Province of Saskatchewan were consolidated, changes in the Assessment Act were made, the most notable of which was the order to each rural municipality requiring a statement of the net assessment as contained in the municipal assessment roll and the granting of power to the Commissioner to raise or lower this amount to meet the aggregate sum set by the Department of Municipal Affairs.

During the same year, 1920, an inspection was made of the entire province for the purpose of establishing an equitable aggregate assessment for each rural municipality. The inspection was conducted by four duly authorized land inspectors, each with one-fourth of the province to cover. The procedure was to review the assessment in effect at that time and, through various ways, to secure information as to the selling value of the land, which in turn was to furnish a base for setting the maximum value for the best land in each municipality. The maximum value being thus determined, an estimate of the average value per acre for each municipal unit was secured. These were the factors used to determine the aggregate assessment of all organized rural municipalities.

In the year 1921–22, the Saskatchewan Assessment Commission Act came into force. It became law on March 1, 1922, and provided for the establishment of a permanent Assessment Commission.[1] Since that time and up to May 1, 1939, only minor changes have been made in the maximum values as determined by the survey of 1920. The Saskatchewan Assessment Commission, under the direction of Colin L. Wells, is still operative and is now in full control of rural land assessment in the Province of Saskatchewan.

During certain periods and at intervals, assessments of 302 municipalities have been made by individuals of varied qualifications. Different standards of value were frequently used and the whole structure of rural land assessment resolved itself into a matter of personal opinion. From the year 1930 to 1938 the Assessment Commission exercised a certain measure of control and made an honest effort to have all rural assessments determined by experienced assessors, thereby assuring a reasonable degree of accuracy and equity.

The years 1935 and 1936 saw considerable activity in assessment work, and the government of Saskatchewan empowered the Assessment Commission to investigate thoroughly rural land assessments and to conduct research into the economic structure of the agricultural industry. This investigation brought forth some very interesting facts, the principal of which were *(a)* the complete lack of equity in assessment values as between municipal units, as well as, in a great many cases, within the unit itself; *(b)* the extremely high rate of assessment imposed upon inferior soils as compared to fair, good, and excellent grain growing soils. These

[1] The Saskatchewan Assessment Commission, the personnel of which are: Colin L. Wells, Chairman, J. J. Smith, Deputy Minister of Municipal Affairs, and Commissioner Andrew Leslie.

data, coupled with information received from many other sources, pointed clearly and directly to the very important fact that a proper system of assessment whereby a re-adjustment of assessment value could be made equitably was not only necessary but mandatory. They suggested that something had to be done: that further criteria affecting assessment value had to be considered, and that more factual information regarding the soils of the Province was necessary before any definite move could be made to re-assess such a large area as is contained in the Rural Municipalities of Saskatchewan.

A reconnaissance soil survey of the area lying immediately south of township forty-nine was completed in 1935 and Soil Survey Report No. 10[1] accompanied by a soil map was made available to the public in July, 1936. This report and map were studied carefully, and the first important step in the new system of assessment originated when the Assessment Commission decided to discard former methods of describing soils as chocolate loam, clay, or sand, and to adopt the proper series and type method of soil classification as used by the Soils Department of the University of Saskatchewan.

A reliable soils classification and a soil map were now available; but this was not enough. It was equally necessary that an economic study of a number of farm units in different areas of the Province be made in order that the maximum value of the best land suitable for the production of cereal grains could be determined. The Farm Management Department of the University of Saskatchewan and the Economics Branch of the Dominion Department of Agriculture were consulted and valuable data were secured, such as found in Bulletin 64[2] and the Classification of Land Areas Based on Suitability for Wheat Production (1937 survey).[3] This information was used in reaching reasonably sound conclusions as to the farmer's ability to pay taxes in terms of average efficiency, average production, and normal prices. An endeavour was made to avoid extreme positions which appeared unsound and might cause disagreement.

A natural and a practical land classification was obviously necessary in order that similar lands widely distributed over the Province could be assessed equitably. The definition of these two types of classifications has been stated as follows:—

> "A natural land classification is one in which the natural land types are placed in categories according to their inherent characteristics. A practical land classification is one in which the social units of the land are classified according to their capabilities for man's use with sufficient detail of categorical definition and geographic expression to indicate those differences significant to man."[4]

Based upon this definition of a natural land classification, and at the request of the Saskatchewan Assessment Commission, an index rating or numerical expression of the comparative productivity of the various soil types and phases was compiled by Dr. J. Mitchell of the Soils Department of the University of Saskatchewan.

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[1] Soils Department, University of Saskatchewan Soil Survey Report No. 10.

[2] Allen, Wm., E. C. Hope, and F. C. Hitchcock. A study of probable net farm revenues for the principal soil types of Saskatchewan on the basis of their past production. Bulletin 64.

[3] Spence, C. C. Preliminary report on the classification of land areas based on suitability for wheat production. Department of Farm Management, University of Saskatchewan and the Economics Division, Dominion Department of Agriculture.

[4] Chas. E. Kellogg, Senior Soil Scientist, United States Department of Agriculture:—Definition of a Natural and Practical Land Classification.

The system used in the construction of the index was the multiplication method, as originated by Storie,[1] and modified to suit the conditions that exist in this Province.

The main factors used in establishing the index were three in number (A, B and C). The maximum possible for each factor was 100 points. The following is a schedule of points allotted for each factor.

"A"—Soil Profile—	Points
(1) Texture throughout.	40
(2) Structure throughout.	30
(3) Natural fertility.	30
Possible	100

"B"—Topography—	
(1) Level to depressional.	10– 80
(2) Gently undulating. Slope 1–3%, frequency low.	90–100
(3) Moderately undulating. Slope 3–6%, frequency low.	80– 90
(4) Very gently rolling 2–4%, frequency 4–5.	70– 80
(5) Gently rolling. Slope 4–8%, frequency 4–5.	60– 70
(6) Strongly undulating. Slope 6%, frequency low.	40– 60
(7) Moderately rolling, slopes 8–14%, frequency 3–5.	40– 60
(8) Strongly rolling, slopes 15–25%.	30– 40
(9) Hilly—over 25%.	20– 30
(10) Eroded steep slopes, little vegetation.	10

NOTE.—Frequency refers to the number of complete rolls in half a mile. This is less than two in the case of undulating topography but usually 4 to 5 in the case of very gently to moderately rolling phases of topography.

"C"—Climate, Salinity, Stoniness, Tendency to Drift—	
(1) Interaction of soil and climate as expressed in yield and variability of yield.	25
(2) Salinity. Full marks for none and deduct proportionately.	25
(3) Stoniness. Full marks for none and deduct proportionately.	25
(4) Tendency to drift. Full marks when no drifting and proportionately according to tendency for soil to drift.	25
Possible	100

Section (1) of factor C was calculated by a student[2] working under the supervision of the Farm Management Department of the University of Saskatchewan. Wheat yield data for municipalities covering a period of 20 years were used. Median yields were calculated and the highest median yield (23 bushels) was taken as 100. The standard deviation from the median yield was determined for each municipality and the co-efficient of variability calculated.

A yield index was determined for each municipality by calculating its yield as a percentage of the highest municipal median yield (23 bushels) for the Province. In the same manner a variability index was constructed by calculating the reciprocals of the co-efficient of variability for each municipality as a percentage of the highest municipal reciprocal of coefficient

[1] Storie, Earl R. An index for rating the agricultural value of soils. Agr. Expt. St. Bull. 556, Berkley, California. Revised 1937.

[2] Schrader, F. A study of yields and variability of yields in the Province of Saskatchewan and their relation to soil and climate. Unpublished Study, Department of Farm Management, University of Saskatchewan.

of variability. The reciprocal of the lowest coefficient was taken as 100. The yield and variability indexes were then multiplied together and divided by 100 to give a combined index. The municipality with the highest combined index was taken as 100, and the other municipalities were adjusted accordingly to give the final figure.

In order to translate the yield and variability factor into an index for a specific soil type, it was necessary to select municipalities made up of only one or largely one type of soil. The index of the municipalities was then taken as the index for the predominant soil type. In cases in which a soil type was not distributed sufficiently throughout municipalities to be predominant, interpolation was used in arriving at the final index for that type of soil.

The yield and variability index was applied approximately as follows:—

Index of	Points	or	Points
0 to 10	5		0 to 5
10 to 20	10		5 to 10
20 to 40	15		10 to 15
40 to 60	20		15 to 20
60 and over	25		25 and over

To illustrate the method of obtaining a comparative Master Index Number, or rating for soil types, two examples are given below:—

Soil	Factor "A" (Profile)		Factor "B" (Topography)		Factor "C" (Climate, etc.)	
Regina Heavy Clay	(1) Texture	40	Gently undulating		(1) Climate	15
	(2) Structure	30			(2) Salinity	25
	(3) Native Fertility	30			(3) Stoniness	25
					(4) Tendency to drift	17
		100	×	100	×	82
Oxbow Loam		25				15
		30				25
		25				25
						20
		80	×	90	×	85

Regina Heavy Clay A × B × C = Rating Index of 82
Oxbow Loam A × B × C = Rating Index of 61

This index is not to be considered as a final expression of the assessment value of land, because diversification of farm practice and other modifying factors must be taken into consideration by those making use of the rating. Farm management studies under the direction of the Economics Division of the Department of Agriculture and the University of Saskatchewan, have materially assisted in substantiating the use of the index method of rating soils in Saskatchewan, and have been the means of making comparisons of the productive ability of soils in the several soil zones.

The Practical or Social Land Classification was for the purpose of obtaining equity in assessment for taxation purposes. This takes into consideration a number of factors, such as distance from local market, freight rates on grain to Fort William, cost of machinery by zones, and the cost of first grade tractor fuel. All of these factors were formulated into a separate index which in turn was superimposed on the Natural Land Classification rating, either as a plus or minus adjustment, depending upon the location of the area being surveyed.

In order to use the rating index to determine the value of land for assessment purpose, it became necessary to establish a Log that would be applicable to the entire Province.[1] With that end in view, the Regina Plains were selected for the establishment of a maximum dollar per acre value on wheat producing soil in the Province of Saskatchewan. A maximum value was obtained by weighing carefully many factors such as wheat yields over a 20-year period (1917 to 1936 inclusive), average wheat prices for the same period, cost of operating typical one section power farms, etc. The Farm Budget approach was used to obtain the average net income of $1,215 for typical one-section farms. This net income was capitalized at 5%. A margin of safety, amounting to $6 per acre, was deducted from the capitalized value and the net, or maximum, assessment value for the Province of Saskatchewan became fixed at $32 per acre or $5,120 per quarter section.

To illustrate how the index system is used in assessing land, the following example is given.

One hundred and sixty acres of Weyburn Loam rated in the soils rating index table at 52, with the land situated in a 21-cent freight rate zone, neutral machine zone, and plus one cent tractor fuel zone, would have a Practical Land Classification of minus 3.5 points and the final index to be used in computing the assessment value would be 48.5. Assuming that the land thus rated is of undulating topography, free from stones, no erosion and all arable, the gross assessment value is obtained by multiplying the Log number 6240 by 48.5 and the product is $3,024. The distance from local grain market is then computed, and after two miles, a discount of 1% per mile is deducted from the gross value of land classified as arable. Grazing land areas are not included in this special discount.

Net assessment figures are entered in the assessment roll as $500, $550, $600, $650 up to $1,200. Thereafter all assessments are terminated at even hundreds.

The use of either the Master Index or Practical Land Classification Index, separate and apart from each other, is not practical and should be avoided. Likewise, it is proper to say that the use of this method in assessing rural land by untrained persons is likely to prove unsatisfactory. Proper training and experience is necessary to recognize soil series, types and phases that each individual assessor or appraiser encounters daily in the course of his work.

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[1] No soils in Saskatchewan were rated in the Master Index at 100. A rating of 82 equals $32 per acre or $5,120 per quarter section.

$$\frac{100}{82} \times 5120 = 6243$$

For easy calculation this number was reduced to 6240. It is called the Log.

Those connected with either the promotion of the Saskatchewan System of Assessment or its application, are unanimous in the opinion that a complete soil survey, and an economic survey of at least a portion of the Province of Saskatchewan were absolutely necessary before a proper assessment could be made. Any attempt at a revision of assessment value without the assistance of the above would have been premature and, consequently, of little value.

The "Saskatchewan System of Rural Land Assessment" may rightfully be called a science, based upon the science of soils and the science of farm economics. Rural land assessing in Saskatchewan is a profession that none but properly trained men of undisputed integrity may enter. A certain standard of education for professional assessors is necessary, and in addition, each applicant must qualify himself further by attending a 6-weeks course at the University of Saskatchewan, where he is taught the elementary rudiments of soils, farm economics, value theory and assessment procedure. A written examination on the above subjects is given at the end of the term, and each successful candidate is given a probationery certificate entitling the receiver to practice as a recommended assessor for one year only. At the end of the seasonal term, an additional 2-weeks course dealing principally with soils is available to those whose probationery certificates have not been revoked. Following a further written examination, successful candidates are given a permanent certificate indicative of their qualifications.

The Government of Saskatchewan, by statute assented to on May 1, 1939, empowered the Assessment Commission to conduct re-assessment of all rural land in the Province. Saskatchewan, south of township 49, was accordingly divided into 5 assessment zones and a 5-year program of assessment was tentatively mapped; twenty-two trained men make up the force: 18 assessors, 3 supervisors and 1 bench mark evaluator are now doing assessment work in the Province.[1]

The work is conducted in an orderly and well controlled manner. Thus, the continuity of the work ensures a degree of accuracy and uniformity quite unattainable in the past. Everyone connected with this all important work is aiming for equity, sound principles, and fairness in rural land assessment for the Province of Saskatchewan.

[1] A specially appointed assessor conducts a preliminary survey of every municipality to establish bench marks or standards of value that are subsequently used by assessors as guides and bases for comparison.

FACTORS AFFECTING THE SUCCESS OF FARM MORTGAGE LOANS IN WESTERN CANADA[1]

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The lack of adequate financial resources is often the most important limiting factor in the successful operation of a farm. A higher degree of commercialization accompanied by an increase in mechanization has greatly increased farm capital requirements in recent years. While some farmers have been able to supply their increased capital requirements from savings accumulated over a term of years, in many cases it has been necessary to make extensive use of credit. The presence of financial institutions designed to meet the special credit needs of farmers is important. The efficient organization and operation of such institutions is essential to a prosperous agriculture. In the discussion which follows, consideration will be given to some of the factors determining the success of farm mortgage loans under the following broad headings: (1) Appraisal policy, and (2) Loaning policy.

APPRAISAL POLICY

The first consideration of a soundly operated financial institution is the security upon which it lends the funds entrusted to its care. It is of the utmost importance, therefore, that the appraisal of that security should be on the soundest possible basis. In an effort to determine the basis commonly employed in the appraisal of farm real estate as security for mortgage loans, a questionnaire was sent to the principal farm loan agencies operating in Western Canada. Replies to this questionnaire were almost unanimous in stating that their appraisals had been based on sale value. A typical application form required the applicant to give the present market value or price which could be obtained for the property broken down into land and buildings. The inspector's report commonly called for separate estimates of the value of the cultivated land, the uncultivated land, and the land which was unfit for cultivation, together with the amount which the buildings added to the value of the land. The sum of these figures was referred to as the selling value of the property. In addition the inspectors were frequently asked, "What would the property now sell for with one-fifth cash?" Additional information was also requested concerning the last sale price of the property as well as recent sales in the vicinity. In addition to an estimate of the sale value of the property, information supplied on appraisers reports was limited for the most part to a consideration of the soil, the locality, and some general information regarding the applicant. A number of forms also provided for a list of the applicant's assets and liabilities. Practically all, however, had no provision for information with regard to the income likely to be obtained on the farm over a long period, and were inadequate from the

[1] Address delivered before the Twelfth Annual Meeting of the Canadian Agricultural Economics Society at the University of Manitoba, Winnipeg, Man., June 20–21, 1940, held in conjunction with the Twentieth Annual Meeting of the Canadian Society of Technical Agriculturists.

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standpoint of enabling a supervisor in a central office to visualize the security offered and thus pass judgment intelligently on the desirability of the loan.

Since sale value reflects the opinion of the group of individuals who make up the market, it is considered by many writers to be the best measure of value. Given a "perfect market", in the case of consumable goods, the market price undoubtedly is the best obtainable measure of value. The necessity of forecasting future income in the valuation of land or capital goods, however, introduces a factor which reduces the accuracy of this market value. A comparison of farm sale values and the prices of farm products indicates that sale values are for the most part based on current earnings, little consideration being given to probable price trends. As a consequence, appraisals for loan purposes based upon sale values cause inflation of land values during periods of rising prices due to excessive liberality in lending. During a period of falling prices, on the other hand, land values are deflated and it is often impossible for a farmer to obtain sufficient credit to meet his needs.

The effect of the use of current sale values as the basis of appraisal may be illustrated in connection with an actual loan made on a half-section farm in Saskatchewan. This farm was appraised by the loan inspector in 1918 at $10,000 and a loan of $4,000 was requested and granted. Since the average sale value of farm land in Saskatchewan which was estimated at $29 per acre in 1919, declined to $16 per acre in 1932, the appraised value in 1932 based on sale value would have been $5,500 as compared with $10,000 in 1918. While the loan of $4,000 granted in 1918 was only 40% of the appraised value, a loan equal to 40% of the appraised value in 1932 would have amounted to only $2,200. A maximum loan of 50% of the appraised value would have amounted to $5,000 in 1918 and $2,250 in 1932. Thus in 1918 the farmer would probably receive more than was actually necessary to finance his farm operations, while in 1932 he would have been financially handicapped by lack of funds. The use of probable normal income, on the other hand, would have resulted in an appraised value between the two extremes and a loan which probably would have met the requirements of the farmer and have been within the capacity of the farm to repay. Based on the average calculated gross income for the period 1919–1935, and an average period of about 4 years for receipts on a Saskatchewan wheat farm to equal the capital in real estate, the value of the farm would have been about $7,000. While these estimates have been roughly calculated, they at least illustrate the application of the principle of appraising farms according to the anticipated long-time income.

A perfect market, moreover, implies that the commodity sold is uniform or that there is a complete and accurate knowledge of all differences in it. From this standpoint, the land market cannot be considered a perfect market. Land not only lacks uniformity but the elements of variation are not generally known. In this connection, a study of apple farms in the Newfane-Olcott area of Western New York during the 13-year period 1913 to 1925 indicates that a farmer might better have paid $292 per acre for an average farm on Dunkirk sandy loam soil than have accepted a farm on Clyde fine sandy loam soil as a gift.[1] During this period, farms

[1] Scoville, G. P. and others, "The Apple Situation of New York", Cornell Ext. Bulletin 172, 1928.

on Dunkirk sandy loam soil sold at prices approximating $292 per acre while those on Clyde fine sandy loam were valued at $182 per acre. That is, individuals making up the farm real estate market not only failed to consider the longtime price trend but also failed to give sufficient consideration to the relative earning capacity of farms on the different soil types.

In purchasing a farm the buyer usually has a three-fold objective—that of securing a home, a job for himself and family, and an investment for his capital. The amount which he will pay for a farm, therefore, reflects what he considers to be the value of the farm based on the value of the perquisites and the anticipated returns to himself and family for their labour and capital. Since the value of family living as well as basic farm wages for family labour tends to be relatively fixed for all sizes of farms, their inclusion in the determination of the price to be paid for a farm causes the sale value of poor farms to be greater than that of good farms.[1] Willing buyers may be found for small farms of low productivity which will provide shelter and a subsistence for the farmer and his family but yield no surplus income from which to repay a loan. It is loans on such farms that constitute the greatest problem to loaning agencies which depend exclusively on sale value as the basis of their appraisal policy.

It is a fair statement to say that farm loan agencies are in business for the purpose of making loans and have no particular desire to become holders of farm real estate. The only satisfactory basis, therefore, for measuring the success of a loan is in terms of the degree to which the borrower has been able to meet his obligations. Since success of a loan in the final analysis is dependent on financial success in farming, knowledge with respect to those factors associated with successful and unsuccessful loans should prove useful, not only to those agencies or individuals making loans on the security of farm real estate, but also to all farmers who are at the same time potential borrowers. It was with this thought in mind that the Economics Division of the Dominion Department of Agriculture undertook a study of the lending experience of a farm loan agency which has operated in the province of Saskatchewan over a 20-year period.[2]

In this study, information relating to the borrower, the farm given as security, and the status of the loan was obtained for each loan from the loan applications and inspectors' reports. In an attempt to eliminate the effects of the drought and the depressed economic conditions during the period 1929 to 1935, information relating to the status of loan was obtained as at the end of 1929 as well as 1935. These data were transferred to code sheets preparatory to punching on Hollerith cards for mechanical sorting and tabulation. The principal measure used to denote the relative success or failure of loans was the percentage of the loans which had been foreclosed. The relative status of current loans was measured by the percentage of the loans in good standing, and the amount owed on current loans expressed as a percentage of the original loans. By relating the various factors with respect to which information was available to the success of

[1] The fact that appraisers and assessors tend to over-value poor land and to under-value good land relative to its earning capacity has been shown by numerous investigations including the following: Aull, G. H. and Ernest Riley. Some Inequalities in the Assessment of Farm Real Estate in South Carolina, S.C. Agr. Exp. Sta. Bul. 313, 1938. Hammar, C. H., The Accuracy and Flexibility of Rural Real Estate Assessment in Missouri, Mo. Agr. Exp. Sta. Res. Bul. 169, 1932. Hudson, S. C., Taxation in Rural Ontario, Dominion of Canada, Dept. of Agriculture pub. 489, Tech. Bul. 4, 1936.

[2] It is expected that the results of this study will be made available shortly as a bulletin of the Dominion Department of Agriculture.

individual loans it has been possible not only to account for the failure of a large number of the loans but also to establish principles with regard to the appraisal of farms in Western Canada for loan purposes.

Physical Factors

Through their effect on production, the basic physical factors, climate, soil and topography were found to account for the greater part of the variation in success of loans.[1] As a result of regional differences in climatic and soil conditions, the percentage of the loans foreclosed was found to be progressively greater in the dark brown, black, and grey soil zones in the eastern part of the province, while in the western half of the area the rate of foreclosure decreased between the light brown soil in the south and the grey soil zone in the north. This may be explained largely on the basis of variation in the average long-term yields between different areas and in the variability of yield from year to year. The fact that soil is one of the most important single factors causing variation in the foreclosure rate is indicated by a great increase in the proportion of the loans on the poorer soil types which were foreclosed, as compared with soils which are well adapted to wheat production. A significant increase in foreclosures also occurred on land of hilly topography as compared with level land. The combined effect of these physical factors on the loan paying ability of farms is shown most effectively through the relationship of the different land classes into which the land of south-central Saskatchewan has been divided on the basis of its suitability for wheat production. While about 20% of the loans on farms classified as sub-marginal (Land Class 1) were foreclosed, no foreclosures occurred on Land Class V which is considered as being excellent for wheat production.[2]

A close relationship was also shown to exist between these basic physical factors and the current position of the loans outstanding. A greater proportion of the loans on farms having superior soils and a relatively level terrain were in good standing than in the case of those on less productive soils or hilly topography. A smaller proportion of the original loans was outstanding also in the case of the former group.

The close association of these basic physical factors to success of loans indicates the value of maps showing in detail long-term wheat yields, soil types, topography, and land class and the importance of extending soil and land classification surveys to other areas. The appraiser has a difficult task under the best of conditions and should have at his disposal all available information pertaining to the job which he is called upon to perform.

Economic Factors

In addition to the physical factors, consideration must also be given to such economic factors as size of farm, the location with respect to markets and community centre, value per acre and value of buildings, all of which are closely associated with the success of loans. One of the most effective ways of increasing net returns in almost all types of enterprise

[1] For a discussion of the climate, soil and topography of Saskatchewan, see Soils Survey Report, No. 10, University of Saskatchewan.

[2] For a discussion of the basis of land classification in the Province of Saskatchewan, see Spence, C. C. "The Development of Technique in Land Utilization Studies", Proceedings of the Ninth Annual Meeting of the Canadian Agricultural Economics Society, 1937.

is by increasing the size of the unit. This increased return is obtained not only by multiplying the per unit profit by the addition of extra units, but also as a result of increased efficiency arising out of the fact that certain fixed or overhead costs do not increase at the same rate as the volume of production. This is particularly true in the case of wheat farming to which machine production has become so well adapted. Through its effect on operator's profits, size of business is also an important factor in determining the success of loans. The percentage of the loans foreclosed by 1929 averaged about 13% for those farms of less than 200 acres, while in the group having over 600 acres only 4% were foreclosed.

In contrast to the above findings, Dr. F. F. Hill reports in Cornell University Agricultural Experiment Station Bulletin 549 that, "The number of foreclosures on small farms in New York was negligible."[1] The explanation advanced for this relationship was the relatively high residential value attaching to small farms in the northeastern United States when the income from the farm was usually supplemented from some outside source, together with the fact that small acreage did not necessarily mean small volume of business. In Saskatchewan, however, the residential value of farms is relatively low and the possibility of intensive farming is very limited. Under such conditions the farm must yield sufficient income to meet all overhead charges including family living before any payment can be made on interest or principal. It is evident, therefore, that to have any value for loan purposes a farm must exceed a certain minimum size. Farms below that size may give the family a living but will yield no surplus income to repay loans. Since this minimum size varies according to type of farming and location, it is not possible to define any specific limits. Generally speaking, under Saskatchewan conditions, that limit would seem to be about one-half section, although in the northern parts of the province the minimum may be lower.

The advantage accruing from the nearness of farm to market and community centre through lower marketing cost and residential advantages was also found to be related to the success of loans. While, as was brought out in the discussion of soils, inspectors do not differentiate sufficiently between different grades of land in establishing their valuations, the appraised value per acre of the land mortgaged provides a rough index of quality, both as regards earning capacity and desirability of location. In 1929 the percentage of loans foreclosed ranged from 16% for farms valued at less than $10 per acre to 5% for those valued at $25 or more per acre. Since appraised value is the product of acreage times the value per acre, loans on farms appraised at higher values were more successful, as might be expected. Experience goes to show that good land is essential to outstanding success in farming and that poor land may be dear at any price.

The size and condition of farm buildings in an established agricultural community, reflecting as it does the volume of farm products to be accommodated and the net income from which buildings are maintained, provides a reliable index for an economic classification of farms.[2] This is indicated

[1] Hill, F. F., "An Analysis of the Loaning Operations of the Federal Land Bank of Springfield," Cornell Agr. Exp. Sta. Bul. 549, p. 39.

[2] Lewis, A. B., "Methods used in an Economic Study of Land Utilization in Tompkins County, New York" Cornell University Agr. Exp. Sta. Memoir 160. 1934.

by the fact that among the farms on which loans had been made the size of the farm and the appraised value per acre were directly associated with the value of buildings. The relative value of farm buildings also serves as a useful guide in making loans on the security of farm real estate. While in 1929 almost 16% of the loans on farms having buildings valued at less than $500 were foreclosed, less than 3% of the loans on farms having buildings valued at $2,000 or more had been foreclosed.

LOANING POLICY

Even though appraisals are carefully made and represent the true value of the properties offered as security, a sound loaning policy is essential to the success of a loan organization. Such a policy must embrace the borrower and his personal characteristics, the amount which should be loaned, the margin of security required, and the provisions for repayment.

The Borrower

It is generally conceded that the most important single factor determining success in farming is the farmer himself. In this connection the statement is frequently heard that a large loan may be made to a good farmer on a good farm but no loan should be made to a poor farmer on any kind of a farm. A study of variations in the human factor as related to financial returns in farming carried on by the University of Minnesota in co-operation with the Bureau of Agricultural Economics, indicated that such factors as wife's co-operation, age of operator, and such inherent characteristics as mental alertness, ambition, and interest in his work were directly related to farm income.[1] Studies elsewhere have shown a relationship between previous experience and education of operator, nationality and size of family and income.[2] Similarly our study of loaning experience in Saskatchewan has indicated that such factors as the financial character, age and marital status of the farm operator, the size of his family, and whether he owns the farm or operates it as tenant or manager were related to success of loans. It is suggested that loan agencies might well give more attention to the "personal factor" in making loans and should require their inspectors to provide more complete information with respect to would-be borrowers.

Size of Loan

A question which frequently arises in the administration of a loan organization is the relative merits of large and small loans. Certain governmental loan agencies place an absolute maximum on the size of loan which may be made to an individual. The Canadian Farm Loan Act fixes the maximum amount loanable to an individual at $6,000.[3] The maximum provided in the United States Agricultural Credit Act for loans made by the Federal Land Banks is $50,000 with a preference given to loans for $10,000 or less.[4] The original Farm Loan Act set an upper limit of $10,000 which was raised to $25,000 in 1923 and finally to $50,000 in

[1] Wilcox, W. W., Andrew Boss, and George A. Pond. "Relations of Variations in the Human Factor to Financial Returns in Farming", Minn. Agr. Exp. Stat. Bul. 288. 1932.
[2] Warren, S. W., "An Economic Study of Agriculture in Northern Livingston County, New York". Cornell Agr. Exp. Sta. Bul. 539. 1932.
[3] Revised Statutes of Canada, 1927, Chapter 66, as amended by 24–25 George V, Chapter 46 (1934) and by the Canadian Farm Loan Act Amendment Act, 1935.
[4] Farm Credit Administration, American Institute of Banking, New York, p. 209.

1933. Other organizations merely limit the size of the loan to a certain percentage, usually about 50% of the appraised value of the farm offered as security. The reasons that lenders require that the property offered as security for a loan shall have a higher value than the loan are three-fold. The most important is that it provides a guarantee to the lender that if he has to foreclose the loan he can realize the amount of his original investment plus accrued interest and charges from the sale of the property. It has also been found very difficult for a borrower to repay a loan equal to the full amount of the value of the property and maintain his family. From the standpoint of moral risk it is considered that a borrower will make a greater effort to repay his loan if he has a substantial investment in the property himself. About 80% of the loans studied were from 30 to 50% of the appraised value of the farms given as security; 6% of the loans were for more than 50% of the appraised value. Since the amount loaned is based on the appraised value, the relationship between size of loan and success of loan is the same as that between the appraised value and foreclosures to which reference has already been made, the rate of foreclosures being less on the larger loans. Foreclosure of loans also increased rapidly as the loan increased in size relative to the appraised value. The percentage of the loans foreclosed in 1929 ranged from 1% for the group of loans amounting to less than 20% of the appraised value to 12.5% for those which were over 60% of the appraised value. In 1935 this range was from 3% to over 30% foreclosures, respectively, for the same groups.

Theoretically, if the appraised values of the farms upon which loans were made were obtained by the capitalization of the net income remaining after all expenses, including labour, were met, the same margin of security would be satisfactory for all loans. However, because the appraisals were based on sale values which, as mentioned in the foregoing discussion, appear to take into consideration returns to family labour as well as capital, it is necessary to adjust the margin of security to the quality and size of the farm. If, for example, it is decided that no loan should be made on any farm for an amount greater than 50% of the appraised value, it might be necessary to set the maximum amount loanable on the poorest grade of land at 20% of the appraised value, somewhat higher percentages being allowed on the superior grades of land.

A factor disregarded by almost all loan agencies is that since the amount required to support the farm family and meet other overhead costs is relatively fixed regardless of the class of land, a smaller part of the total income remains to service debts on farms having a low income.[1] This situation existed among the loans studied in Saskatchewan, about the same proportion of the appraised value having been loaned regardless of grade of soil, topography, land class or size of farm. This undoubtedly has been an important factor in the high proportion of the loans which were foreclosed on the poorer grades of land and on the smaller farms.

Provision for Repayment

Undoubtedly the greatest single problem facing prairie agriculture is the variability of farm income.[2] This variability arises from two sources,

[1] Studies carried on by the United States Farm Credit Administration in various parts of the country indicate that there is no significant difference in the proportion of the appraised value loaned on good or poor land.

[2] For a discussion of the variability of farm income in the Prairie Provinces and its implications, see "Economic Problems of the Prairie Provinces" by W. A. Mackintosh.

variation in prices and variation in production. While, generally speaking, price variation is usually the more important factor, in Saskatchewan, where wheat is the basis of the farm economy, variability of yield resulting from pronounced variations in rainfall and other climatic conditions is more significant. While a greater measure of stability of prices may be obtained and the variability of wheat yield may be reduced through changes in the utilization of marginal land, farm income in Saskatchewan will never lose entirely its variable nature. It is necessary, therefore, to consider means whereby the effects of this variation in income on the individual farmer may be lessened.

The most serious consequences of a variable gross income arise from the existence of a high proportion of fixed costs. Surveys in representative areas in Saskatchewan indicate that almost 60% of the farm expenses, excluding debt charges, may be considered as being relatively constant.[1] If interest and capital instalments be added, it is apparent that the problem of meeting year to year expenditures on a Saskatchewan farm is very serious.

The importance of adapting long-term contracts to the requirements of the prairie farmer has been recognized in some instances, notably through the crop-share form of lease and the increasing number of farms sold on a crop-share basis. The majority of farm contracts, however, still call for fixed payments, leaving the farmer who is a victim of an uncontrollable variability of income in a precarious and insecure position.

Although a number of writers have supported flexible forms of repayment of long-term loans, little has been accomplished by way of practical application of this principle.[2] The provision for the long-term repayment of loans on an instalment or amortization basis some 20 years ago represents one of the most important single contributions in farm finance, but it has not operated with equal success in all areas. In regions of high variability of income the payments required during good years were not sufficiently high to provide for the years of low income when no payment could be made. While the encouragement of borrowers to build up a reserve fund with their loan organizations during years of high income would probably help the situation, the failure of the borrowers to make substantial overpayments in good years suggests the need for a more positive action on the part of lending institutions by way of some provision for what would virtually amount to enforced savings in order to safeguard loans made in areas of variable income.

In any one-crop farming area where the major part of the income is derived from one source, the logical basis of a flexible repayment system is a share of the crop. In Saskatchewan, over 85% of the farm leases are on a share-rent basis. It is, moreover, the practice of most long-term credit agencies in the Prairie Provinces to require a crop lease from delinquent borrowers. In an area where the principal cause of variability of income is to be found in prices, the use of an index based on the prices of the principal sources of income as the basis for automatically adjusting

[1] Allen, William, "The Farm Business in Saskatchewan", University of Saskatchewan, College of Agriculture, bulletins No. 37, 43 and 52.

[2] Murray, W. M., Iowa Agr. Exp. Station Bul. No. 315, 1934; Galbraith, G. K., Macy, R. M., Malenbaum, W., Journal of Farm Economics, August, 1937; Hill, F. F., Journal of Farm Economics, February, 1938.

the instalment to be paid would involve fewer administrative difficulties. In Saskatchewan, however, the high variability of yield in addition to price makes such a basis impracticable.

For the purpose of demonstrating the adaptation of the flexible loan repayment principle to Saskatchewan conditions, a one-fifth crop share payment plan has been used. Since a common basis for share-renting farms in Saskatchewan is for a one-third share of the crop, the owner supplying all of the capital invested in real estate and paying the taxes, it was decided that one-fifth of the crop should be a fair compensation to the mortgagee who has supplied somewhat less than half of the capital. For purposes of this study the gross farm income was calculated by determining municipal average yields and applying these to the farms within each municipality. The annual production of wheat was calculated by assuming that one-half of the land suitable for cultivation would be in wheat each year and multiplying this figure by the average municipal yield. The gross income was then calculated by using the average Winnipeg price for the crop year adjusted for freight differentials and grade.

To enable a farm to be operated continuously certain items of expense must have a prior claim on income. These include taxes, labour, repairs, tractor fuel and family living. While the amount necessary to cover these items will vary according to size of farm, a conservative estimate[1] of a minimum amount to cover such items on an average Saskatchewan farm is $1,000. In other words, on an average Saskatchewan farm the revenue must exceed $1,000 before anything is available for servicing debts. Many farmers who have had a successful year are financially crippled, not by current expenses, but by accumulated debts resulting from operating losses during previous years of low income. Such a situation should also be considered before current payments on long-term loans are exacted.

The adaptation of different loan repayment plans to conditions in Western Canada may be illustrated by the application of these different plans to an actual loan made in 1918 on a half-section farm in Rural Municipality Number 73. This farm, on which 310 acres is suitable for cultivation, was appraised at $10,000 in 1918 and a loan of $4,000 granted. The payment which the borrower agreed to make annually was $306, including interest at $6\frac{1}{2}\%$ of the outstanding principal and an increasing instalment on principal. Had the payments been made as they fell due, the amount of the principal outstanding at the end of 1935 would have been $2,511. The effect of low gross income relative to estimated expenses is reflected in the fact that no payment was made on either interest or principal in 1920 or in any year following 1928. While in the intervening years the borrower paid up accumulated arrears, and in 1926 and 1928 made payments on the principal in excess of that which was required by the contract, by the end of 1935 he owed $3,171 principal, $66 charges and $1,703 interest, a total of $4,940.

Had payments been made on the basis of one-fifth share of the crop each year when there was a surplus over the estimated necessary farm expenses, no payments would have been required in 1919 or from 1929 to

[1] Probable Net Farm Revenues. University of Saskatchewan, College of Agriculture, Agricultural Extension Bul. No. 64.

1935. During the other years, however, considerably larger payments would have been required, with the result that by the end of 1928 the principal would have been reduced to about $138. While it must be admitted that the accuracy of the method used in estimating the farm income and expenses may be open to some question, the difference in the net result is so great that there can be little doubt about the superiority of a crop-share payment plan as applied to Saskatchewan conditions.

The use of the crop-share payment plan as a basis for loan repayment has been criticized by some authorities on farm credit from the standpoint of the cost of administration together with the difficulty of financing an institution under such a system on bond issues maturing at regular intervals. While the cost of administration under a crop-share plan might be somewhat greater than under a system of regular payments, this is over-shadowed by the possibility of reducing losses through better collections under the crop-share plan. In an area such as Saskatchewan where the principal source of income is wheat, which must be marketed through an elevator system, the problem of collections would be materially simplified by commissioning the elevator companies to act as collectors for the loaning agency. A clear understanding of the system and the fact that it is designed to aid the borrower in repaying his loan should go a long way in removing any tendency on his part to avoid making the required payments. The objection to the crop-share system on the grounds of the difficulty of meeting maturing bond issues is not valid, since under highly variable crop conditions, it is impossible to meet regularly maturing bond issues under any system of payment. It would seem, however, that a system of reserves together with a more flexible type of bond issue would adequately meet the situation.

SUMMARY

Farm loan institutions perform an essential service to agriculture and should be regarded as an integral part of the industry. The efficient performance of this function is of vital importance and can be achieved only through an appreciation of farmers' problems and a recognition of the fundamentals of sound agricultural finance. A study of past loaning experience can serve as a useful guide toward a more efficient performance of that function. Recent studies suggest the need for more careful appraisals and a repayment policy better adapted to the needs of western farmers.

LAND CLASSIFICATION IN WESTERN CANADA[1]

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The subject which was originally assigned to me for discussion was "Progress in Land Classification in Western Canada", but I suggested "A Basis for Land Classification in Western Canada" in the hope that I might be able to make a contribution to the theory of land classification. This hope remains in its original and indestructible form. The present title is perhaps more appropriate for what is to follow.

It is not necessary to apologize for the introduction of information regarding the development of land utilization research. This is necessary to an understanding of the whole problem of land utilization. Incidentally the expression "land utilization" is one that is misused more frequently than almost any other. One would imagine that it is one of the very newest discoveries.

It is essential that we keep specific objectives in mind in planning land utilization research, and realize that one objective may call for quite different technique than would be the case if some other objective were desired. In the earlier land classification projects, the general objective of a sound use of land was frequently used. In this connection, C. P. Barnes has suggested that:—

> "If land classification is to be advocated in a given situation or area, it should be because it serves a rather specific and definite purpose. A more definite objective than that of 'achieving a sound use of land', or adjusting land use to land character, will generally be needed to justify a land classification project and to indicate what its form and requirements will be."[3]

This point of view is correct. Of course, this was written in 1936 long after the sound land use program was instituted. Barnes further states that:—

> "By classification is meant the process of placing cases or objects into categories, the better to compare their characteristics and to accord similar treatment to similar cases or objects. Land classification consists in placing definite bodies of land in categories which help us compare their characteristics and treat similarly bodies of land having similar characteristics. Thus placing land in classes according to slope, present use, elevation above sea level, or average distance from Peoria, Illinois, is properly called land classification if that term is broadly defined.
>
> "In land-use planning, however, land classification has a more specific meaning. Here, it is generally understood to mean the placing of bodies of land into classes which are described in terms of their use-capabilities. Even following this more specific definition, land classification may take a variety of forms. Bodies of land may be classified as to their *relative* suitability for some use, as is the case when soil types are graded according to their productivity for agriculture or for given crops. In other cases bodies of land may be classified in

[1] Address delivered before the Twelfth Annual Meeting of the Canadian Agricultural Economics Society at the University of Manitoba, Winnipeg, Man., June 20–21, 1940, held in conjunction with the Twentieth Annual Meeting of the Canadian Society of Technical Agriculturists.

[2] Senior Agricultural Economist, Agricultural Economics Division, Marketing Service, Dominion Department of Agriculture, Ottawa, Canada.

[3] Barnes, C. P. A. "Land Classification, Objectives and Requirements". Land Use Planning Publication No. 1, p. 1, Resettlement Administration, Land Utilization Branch, Washington, D.C.

such a manner as to indicate the enterprises or types of operating units for which lands are suited or unsuited. The classification may deal with *natural* bodies of land, such as soil types, the distinguishing characteristics of which are those of the natural or physical environment, or it may be concerned with *cultural* bodies of land, such as farms, ownership units, or the forty acre tracts of the rectangular land survey, of which it attempts to indicate the difference in use capabilities."[1]

The classifications referred to later in this paper are not those affecting the natural resources of a nation as a whole; the particular problem which we have undertaken is to classify areas of a specific natural resource, namely, agricultural land which has been brought into cultivation. Some of this land has been cultivated for a considerable period. Some has been worked for a shorter period, and in some instances this has caused us concern lest the experience in production on such land be insufficient to provide an accurate guide to future performance.

The ideas upon which land utilization and land classification are based are not new. David Ricardo gave us one of the principal ideas in land classification in his treatment of the extensive margin of cultivation presented in his development of the theory of rent.

In North America, land classification seems to have received an impetus at the close of the war of 1914–18. In both the United States and Canada, we had then begun to observe and reflect upon the period of rapid expansion which took place in the latter part of the nineteenth century and the early part of the twentieth century. Toward the close of the war, the Soldiers' Settlement Board was established in Canada and this Board requested the Department of Interior to make studies of land available for settlement. In a small pamphlet published in 1926 by the Department of Interior, it is stated that land classification studies were commenced in 1918

"the chief purpose being to assist settlement by placing before the intending settler information that will *help him to choose a desirable farm*, and to assist development by ascertaining more definitely the *resources of the country*."[2]

Of course, Captain John Palliser's report on Western Canada was an early attempt at land classification. In part, he refers to the "triangle" as follows:—

"This central desert extends, however, but a short way into British territory having as its base the 49th parallel from longitude 100 to 114 west, with its apex reaching to the 52nd parallel of latitude."[3]

Palliser was instructed to examine the nature of the soil, its suitability for agriculture.

It is not possible in a short paper to recite all the steps in the development of economic classification of land, but reference should be made to a report published in 1927 by the government of Manitoba entitled "Unused

[1] Ibid, p. 2.
[2] Department of Interior, Topographical Survey, Bulletin No. 40, "Land Classification in Western Canada", p. 1.
[3] Journals, Detailed Reports, and Observations Relative to the Exploration by Captain John Palliser of That Portion of British North America Which in Lattitude Lies between the British Boundary Line and the Height of Land of the Northern or Frozen Ocean Respectively and in Longitude Between the Western Shore of Lake Superior and the Pacific Ocean, During the years 1857, 1858, 1859 and 1860, p. 7. British Parliamentary Papers, 1863.

Lands of Manitoba", by R. W. Murchie and H. C. Grant. This was an inventory of the unused lands of the province. A statement in the introduction of this report is worth recalling:—

> "As the best land of the province began to be picked over and as the great influx of immigrants at the beginning of this century rushed to take up land, it soon became evident that some of the land on which they settled was decidedly inferior, at least from a *grain growing* standpoint. It was, nevertheless, true that many of these immigrants had come from countries where much poorer land had been farmed for generations, and the farms they chose seemed to suit them well enough. What they neglected to take account of was the difference in climatic conditions and in economic conditions such as transportation. Land of a quality which could be economically developed under European conditions turned out to be submarginal under Western Canadian conditions. Then arose the necessity for close examination of the soil characteristics before land was opened for settlement."[1]

To this might have been added other things including transportation and arability.

Now may I digress at this point to observe that my own association with land economics commenced in 1921 when as a graduate student at the University of Wisconsin, I came under the guidance of Dr. R. T. Ely, Dr. R. B. Hibbard and Dr. Geo. S. Wehrwein. Some of you may recall that in 1922, Dr. Ely, Dr. Wehrwein and Dr. Mary L. Shine published three volumes on land economics, Volume I was entitled "Characteristics and Classification of Land". In this volume, you will find the following:—

> "When it is realized that land in economics is equivalent to natural resources, the fact that it has been treated as a unit, as a single undifferentiated factor in production, must seem astonishing. What is it that we can say of all land? Land has extension, it occupies space, we can measure its area on the surface of the earth. This is a necessary and convenient procedure. Land is sold by superficial area the world over, but American experience shows us beyond all dispute how faulty this system is, and the more carefully the present situation is examined, the more clearly the unfortunate results of this treatment of land as a unit are seen . . . . when area only is considered the results are unintended inequalities and failure to accomplish desired purposes. The one hundred and sixty acre homestead is one of the many illustrations that could be readily cited. This area makes a suitable family farm in a large part of the Mississippi Valley, and today constitutes a rich inheritance in that region, but in the arid west and on the open ranges, the family owning two thousand acres may be in poverty. Quality must be coupled with area to give us adequate measurement of land. We want economic measurements for economic purposes and physical measurements must be subordinate in any satisfactory land policy. It is land capacity that is significant . . . . land classification is then an absolutely essential prerequisite of any satisfactory treatment, scientific or practical of land as an agent of production and of land ownership as a force in the distribution of wealth . . . . "[2]

[1] Murchie, R. W. and H. C. Grant. "Unused Lands of Manitoba", report of a survey, 1926.
Craig, G. H. and J. Coke. "An Economic Study of Land Utilization in Southern Alberta," technical bulletin No. 610, Dominion Department of Agriculture.
Morton, A. S. and Chester Martin. "History of Prairie Settlement and Dominion Lands Policy," MacMillan Company of Canada, 1938, pp. 514–545.

[2] Ely, R. T., G. S. Wehrwein, and Mary L. Shine. "Outlines of Land Economics," Vol. I, "The Characteristics and Classification of Land," p. 43.

Dr. Ely appeared at President Harding's conference in 1922 and here he is quoted as saying:—

> "No land policy is worthy of a moment's consideration that is not based upon the classification of land. Let us place, therefore, first of all land classification . . . . it is imperative to classify with a view to determining what areas should be devoted to crops, to grazing, and to forests, since we must have distinct policies for each of these kinds of land."

and the final report of the Committee concluded:—

> "The areas that are to be devoted to reforestation, as well as the areas that should be reserved . . . . for pasture and crops, should be determined by deliberate selection . . . . to this end a systematic classification of our reserve land is requisite."[1]

Those interested in the economics of land classification would do well to read again these three volumes along with a contribution by L. C. Gray and Mark Regan in the February, 1940, issue of the Journal of Farm Economics as well as certain other articles referred to by Dr. Gray and Dr. Regan.[2]

It remained, however, for the State of Michigan to undertake land classification as viewed from the economic aspect.

> "The Michigan land economic survey was commenced in 1922 when Charlevoix County was selected as the experimental laboratory to work out means to diagnose the burdensome land problems in northern Michigan. The idea of such a survey was first conceived in 1916 but due to legislative and financial difficulties did not become an actuality until 1922."[3]

The permanent set-up of co-operating agencies and personnel was established in 1923. This organization was effective until 1933 when it lost its biennial appropriation and was discontinued as an economy measure. It may be recorded here that following the agricultural conference, the Division of Land Economics was established in the Bureau of Agricultural Economics about 1922.

Now let me introduce a new stream of thought. In 1924, Dr. William Allen, now Agricultural Commissioner for the Canadian Government in London, England, and formerly Professor of Farm Management, University of Saskatchewan, made a study of marginal lands in Pharsalia Township, Chenango County, New York State.[4] Dr. Allen returned to the University of Saskatchewan and subsequently directed studies in farm management, farm indebtedness, settlers' progress, and farm net revenues.

Problems of land utilization and land classification have always been uppermost in the minds of those responsible for the direction of the program of research planned in the Economics Division. At the annual meeting of this Society in 1930, Dr. J. F. Booth referred to the land use problems and their importance in a paper as yet unpublished in which he

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[1] Lovejoy, P. S. "Theory and Practice in Land Classification," Journal of Land and Public Utilities, Vol. I, No. 2, pp. 164–165.

[2] Gray, L. C. and Mark Regan. "Needed Points of Development and Re-orientation in Land Economic Theory," Journal of Farm Economics, Vol. XXII, No. 1, February, 1940, pp. 34–38.

[3] Michigan Department of Conservation, Seventh Biennial Report, 1933–34, p. 71.

[4] Allen, W. "The Utilization of Marginal Lands," bulletin 470. Cornell University, 1929.

outlined a program of research in agricultural economics. In the following year, before the annual meeting of the Canadian Political Science Association he said:—

> "Briefly stated our land settlement laws have not always been perfect. Regions have been settled for farming purposes which, perhaps, should not have been. Climatic, soil and other conditions could not always be carefully analysed before the demand for land caused areas to be thrown open for settlement. Farmers have settled on holdings too small to insure the support of families.
>
> "Then, too, the trend toward mechanization has materially influenced farming in many districts. Difficulties in this connection are not confined to the newer settled areas. The competition of these virgin areas, improved transportation, loss of soil fertility, and other causes have brought land utilization problems to the attention of people in the older provinces. We are confronted with some very serious problems in this general field which challenge the most careful study."[1]

Commencing in 1930, the return of another cycle of aridity in large areas of Western Canada took place and by 1935, the statesmen of the country had been so impressed, particularly by the amounts of relief that were necessary, that it was decided that something had to be done. The Prairie Farm Rehabilitation Act was passed. At first, the ideas developed under this program were all associated with improved cultural practices and water development, but Dr. H. Barton, Deputy Minister of Agriculture, felt that the economic phases of this problem should not be neglected, and in 1935 he requested that the Economics Branch undertake research designed to provide such information. Dr. W. Allen and Professor E. C. Hope had been working with Dr. J. Mitchell of the Soils Department at the University of Saskatchewan. Among other things, they had successfully related farm income and soil type. This was the jumping off point for land utilization and land classification studies using farm management research as a spring-board. In 1935, the surveys initiated by Dr. Allen in the Gravelbourg-Johnston Lake area and in which our Division was associated, emphasized farm inventories, receipts and expenses and took cognizance of soil type, topography, stoniness and other facts of a similar nature. In the Vulcan-Lomond area in Alberta, in a study carried on in co-operation with the University of Alberta, even greater detail was secured because of the lack of farm management research in that province. In 1936, however, a complete change in the program was made. We had reached the conclusion that an analysis of data pertaining to the short-run problems, however important as such, would not solve the problem of agricultural adjustment in Western Canada, and that it was necessary to embark on a program of research in land use and land classification. We made ourselves acquainted with more recent techniques employed in the United States and proceeded to devise schedules which minimized farm management data and maximized land acquisition, condition of buildings and yields of wheat where these could be secured over a long period of years; farm price series were set up to provide for the determination of net revenue. It was realized that administrative bodies such as the Saskatchewan Land Utilization Board and the Special Municipal Areas Board in

[1] Booth, J. F. "A Program of Research in Agricultural Economics". Proceedings Canadian Political Science Association 1931, Volume III, p. 157. 1931.

Alberta as well as the Prairie Farm Rehabilitation Service would be able to apply results of our research; hence these agencies were consulted regarding areas to be studied and data desired. The schedules used were modified to meet these requirements in so far as possible but we had to keep in mind that we were undertaking a specific project and that, within practicable bounds, it should be carried forward as such. Moreover, in these initial stages, we had a problem of adapting techniques developed elsewhere to the conditions obtaining in Western Canada.

It is now pertinent to bring into this picture the process of synthesis so essential in land utilization or land classification studies, but not new in economic science. Economics bears close relationship to other social sciences such as law, political science, sociology and ethics as well as history and psychology. Agricultural economics in certain phases bears close relationship to animal husbandry, field husbandry, and so on. In land utilization and land classification, it is necessary to draw on information developed in other scientific fields in order to gain a desired result.[1] This does not mean that other sciences are subordinate to economics. They are integral parts of a whole, but in the words of Dr. Ely already referred to, we must have economic measurements for economic purposes. Land is used to produce goods with which to satisfy wants directly or indirectly through the expenditure of income derived from the soil to secure goods desired. It is with this that economics in a large measure concerns itself.

Let it be understood that soil surveys or topographic surveys or geographic surveys, climatic surveys or economic surveys do not in themselves provide all the data that is required for land classification. This is not always recognized by young scientists, but it is more fully appreciated by older men whose interests in science widens as the years go by and one's appreciation of the contribution of others to science assumes a more balanced position. Thus in our land classification projects, we have consulted soil scientists, agronomists, live stock men, botanists, and sociologists. Land use and thereby land classification is a socio-economic problem in the solution of which physical data are required. The final determinants must be data of socio-economic or even of a psychological character.

This brings us to the problem of the margin of cultivation. Professor Andrew Stewart has defined marginal land as land which without payments for its use may be expected to provide a return to the farmer merely sufficient to induce continuity of production.[2] A farmer who purchases such land and farms it cannot expect any return on his investment *in land*. In other words, the gross income from production on such land would be sufficient to provide for labour, management and capital used in production, but not a return for the use of the land. These are costs which must be met or else the land will go out of production. Therefore, in land classification, one of the primary problems is to set up a budget which will enable within limitation, of course, the determination of the line of demarca-

[1] Black, John D. (Editor.) "Research in Agricultural Land Utilization." Scope and Method, No. 2, Social Science Research Council, 1931, pp. 5–9.

[2] Stewart, A. "Introduction to a Classification of Land in the Special Areas of Alberta." Unpublished data.

tion between marginal land and submarginal land. In the determination of the margin, we must first take into account the return that is necessary to induce the farmer to continue to operate the land. This is a practical application of the marginal concept largely accepted by economists. It is not easy, for as Dr. L. C. Gray and Dr. Mark Regan have well pointed out:

> "An important task in land classification is determining the advisability of the advance, the continuance, or the retreat of agriculture—or in conventional terms, the location of the extensive margin of cultivation;—for, the one or the other of these trends has important implications with respect to institutional patterns, capital and debt structure, public finance, and numerous other considerations."[1]

I think it might be said that in developing the budgets that have been used for this purpose, an endeavour has been made to secure the closest possible approximation to the margin. Furthermore, we have been thus far engaged in classifying land which has on the basis of past experience two major uses, wheat production or grazing. We have made no attempt to classify grazing land as such but if land in Class I cannot be used for grazing, it is not likely to be used for any other form of primary production unless it is located in an area where reforestation is feasible. Economists recognize that marginal land may not be a definitely fixed grade of land but it may be established for a sufficiently long period of time for its classification to become a useful public service. As in the case of taxation, re-assessments are necessary from time to time so some revision in land class boundaries may be essential. It is also true that if some epochal change in agricultural technique occurred, it would affect the margin, but such occurrences seldom take place and if such did take place, it would in all probability tend to emphasize the variations in the land classes established.

It is not within the scope of this paper to do more than mention the technique of classification. The distinction between land classes is based upon the number of bushels of wheat available for sale per quarter-section converted to net productivity. Wheat production has been and probably will continue to be the major land use in the areas classified particularly in Saskatchewan but grazing may become the major use in the Alberta area. There are four steps in the classification:—

1. The determination of gross productivity per quarter-section of land.
2. The conversion of gross productivity into terms of net revenue.
3. The classification of parcels on the basis of certain ranges of estimated net revenue.
4. Modification of such classification on the basis of the characteristics of individual parcels.[2]

[1] Gray, L. C. and Mark Regan. "Needed Points of Development and Re-orientation in Land Economic Theory," Journal of Farm Economics, Vol. XXII, No. 1, p. 34, February, 1940.

[2] For a detailed description of methods, see E. C. Hope—"An Economic Classification of Land in South-Central Saskatchewan," pp. 257–298. Thesis presented in the Graduate School at Cornell University in partial fulfillment of the requirements for the degree of Doctor of Philosophy, 1939.
Porter, W. D. "Land Utilization Research in Alberta." Economic Annalist, Vol. IX, No. 1, p. 3, February, 1939.
Spence, C. C. "The Development of Technique in Land Utilization Studies," pp. 32–38. Proceedings, Canadian Agricultural Economics Society, 1937.

In the Sounding Creek area in Alberta, which was classified in 1936, we used a zone method. These zones were later combined in land classes. This method was not continued, and additional work was carried out to bring the classification in this area into line with that employed elsewhere. The zone method is satisfactory for the delineation of land class boundaries, but if the objective is to make a land use classification the basis of adjustments in taxes or in the extension of credit, the quarter-section basis is preferable. This demands considerably more detailed inspection but has proven to be feasible.

In Western Canada, the Economics Division in co-operation with the Department of Farm Management, University of Saskatchewan, has now classified the land in 56 rural municipal units, representing more than 11,500,000 acres of land. In Alberta, the Special Areas and the municipality of Acadia Valley have been completed, representing about 8,000,000 acres of land, and preliminary work has been done in five municipalities in the southwest corner of the province. We have made a good start but our progress may be a little slower from now on because we will of necessity have to work in more densely settled areas. With increased intensity of cultivation, the problem of land classification involves greater detail.

Land classification is but the initial step. We are carrying on research in farm management, land tenure, and ranch organization, and this year we will probably undertake a study of irrigation farming in Alberta. All of these projects are part of a program of economic research designed to assist in the development of an effective land use policy in Western Canada.

Of the total area which has been classified in Saskatchewan, 39.7% was placed in Land Class I, that is unsuitable for wheat production and better adapted to grazing; 18.3% has been classified as marginal and placed in Land Class II; 28.6% was placed in Land Class III, that is fair wheat land; 12% was placed in Land Class IV, which includes good wheat land; and 1.8% was placed in Land Class V, which contains land of highest productivity thus far classified.

In Alberta 79.64% of the parcels were placed in land class I; 14.15% in land class II; 4.92% in land class III and 1.30% in land class IV. It is not suggested that either of these areas is representative of the province in which they are located.

In both provinces, data obtained in the land classification projects have been of great assistance in dealing with inequalities in rural assessments. In Alberta, prior to the date of a statutory assessment, those responsible have obtained data collected by our staff and have indicated that the information secured has been very useful.

In Saskatchewan, a re-assessment is now under way and the officers in charge have secured a great deal of data from our surveys. The reassessment was begun in a block of rural municipalities in which the classification had been completed and for which we had aerial photographs. In cases along boundary lines, it has been found practicable to adjust the assessment of individual parcels so as to be in harmony with the division in the land class.

In connection with farm indebtedness in Saskatchewan, information was first collected in 1935. Subsequently, through the aid of the Saskatchewan Adjustment Board which is now handling the voluntary blanket adjustments of first mortgage and agreement of sale indebtedness as of January 1, 1937, the status of indebtedness of a large number of farms in the area surveyed has been examined. The information which has been assembled on the past performance of the land enables the determination of the debt-carrying capacity of these farms. During the past winter, the co-operation of the large farm loan companies in Saskatchewan was secured, and the history of loaning operations of these companies with particular emphasis on the history of payments made on principal and interest from 1921 to 1936 was undertaken for both current accounts and accounts closed. The purpose of this is to determine in so far as possible from the actual experience of the several loan companies, the indebtedness which land in the various land classes could reasonably be expected to carry over a period of years. The need for such research is apparent from the number of cases in which officers of Boards of Review appointed under the Farmers' Creditors Arrangement Act have sought information from members of our staff. This study complements a study of the experience of the Saskatchewan Farm Loan Board conducted by Dr. S. C. Hudson of the Economics Division, Marketing Service, Dominion Department of Agriculture.

For the farmer, a land classification is a guide with respect to future policy; within limits, farmers operating submarginal lands are being moved to marginal or better grades of land, thereby increasing the regularity and potential amount of income and the security of the farm family. These are but a few illustrations of the results of a land classification project which was begun in 1935 but really has only been in operation since 1936—four short years.

We have given a lot of thought to the development of a technique in land classification which will result in the establishment of land class boundaries which will stand scrutiny. We are continually searching for ways and means of improving this technique and we think that if adjustments are to be made in western agriculture those adjustments should be made on the basis of the best factual evidence procurable.

In conclusion, may I quote an English Geographer of note who has ventured into the field of land utilization:—

> "Britain is not a blank sheet of paper in an architect's or a town planner's office. Any planning of the land of Britain must start from the present position. The present utilization of the land is extremely complex and in our country, perhaps more than in any other of comparable size, varies greatly from one part to another. This utilization is, indeed, the result of some two or three thousand years of settlement, of a long-continued process of trial and error. It must, therefore, be our first duty as scientists to study the factors whose long-continued action and reaction have led to the present position.
>
> "These factors may for convenience be considered in three groups:—
>
> *(a)* the natural or geographical factors,
> *(b)* the historical factors,
> *(c)* the economic factors.

"I shall concern myself mainly with the first group, but it must not be thought, therefore, that the second and third groups are considered in any way of minor importance . . . .

"With the improvement of national and international transport and communication, the natural tendency is for each part of the country to be devoted to those uses for which the natural features fit it. This is the whole secret of planning; so to study the factors involved as to determine the *optimum use* of every acre of its surface. This includes far more than mere production—the land must be used for the satisfaction not merely of the material but of the cultural and aesthetic needs of all sections of the community. Thus the optimum use of certain parts of the country is clearly for recreation and the possibilities of production of food and timber must take a secondary place."[1]

[1] Stamp, L. Dudley. "Planning the Land of Britain." Scottish Journal of Agriculture, Vol. XXI, No. 1, pp. 1 and 2. January, 1938.

LAND TENURE PROBLEMS[1]

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The framework of laws and customs governing the relations of man and land has long been an important factor in agricultural development. Changes in the methods of land holding, or the tenure system, have throughout history been accompanied by major movements of agricultural and social progress.

The most significant trends in the growth of tenure systems have been the increasing freedom of the cultivator from the land he cultivated, and the greater freedom of ownership in land. These forces gave impetus to the revolution in agriculture following the breakdown of the feudal tenure system. In most European countries many of the older legal relations of land remain in the present tenure system. Land is still vested with a deep public interest and the present day relations of ownership and operatorship are influenced by the traditions and customs of feudal and semi-feudal tenure. Some countries in recent years have reverted in part to types of tenure very similar to those prevailing under older tenure systems.

Canada, like the United States, began her development largely independent of a traditional system of land holding. The scattered beginnings of feudal and semi-feudal tenure which found their way to the United States and Canada were soon replaced by the newer system of land-holding which grew out of the disposal of the public domains of these two countries.

The freedom of the cultivator found its fullest expression in the type of land-holding developed in America. The fee-simple ownership of land, based on the Torrens system of transfer, and implying almost unrestricted use, was a new concept in land tenure. This, with the wide diffusion of private ownership, created the basis of a tenure system entirely different from those found in most of the older countries of Europe.

The tenure system developed in America was founded on a group of specific objectives. The originators of the land and settlement policies believed that the wide diffusion of ownership among those who cultivated the land would ensure the fullest and most effective utilization of the land resources. They felt also that farm-owning operatorship would give the greatest measure of security to the cultivator and would provide for the most effective organisation of rural social life. Quite as important, they felt that farm-home ownership would furnish the type of political environment and the degree of political stability necessary for a strong democracy.

The practical application of the new tenure system in America has indicated a number of important defects. The most significant of these has been its failure to provide the desired degree of security. A large number of people are now insecure. These are not confined to any specific tenure group. They include farm owners who are heavily burdened with debt,

[1] Address delivered before the Twelfth Annual Meeting of the Canadian Agricultural Economics Society at the University of Manitoba, Winnipeg, Man., June 20-21, 1940, held in conjunction with the Twentieth Annual Meeting of the Canadian Society of Technical Agriculturists.

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families resident in areas incapable of supporting a satisfactory standard of living, families resident on farms which are of inadequate size, tenant families insecure for various reasons, and groups of farm labourers and young farm youth who are insecure because of inability to obtain land to farm.

Similarly the tenure system has not promoted the most desirable utilization of the land resources. Especially important has been its failure to provide uses of land consistent with the long time conservation of the land resources. Arable agriculture has been extended into areas which were incapable of continuing in crop farming. Most tenure groups, to a greater or lesser degree, have maintained an intensity of use which has led to a gradual deterioration of the land area. In some cases, the type of ownership, inadequate credit facilities, and other elements of the tenure system have led to an under-utilization of specific resources.

Moreover, the tenure system has not provided the most desirable degree of stability or the most effective forms of rural social life. Mobility of operators, absentee ownership, and low incomes of operators on certain farms and in certain areas have prevented the development of satisfactory social and community services and have prohibited the development of the most desirable rural culture.

The extent to which the tenure system has failed to meet its objectives in these respects represents the scope of land tenure problems. Specifically, land tenure problems consist of determining why these undesirable features of the tenure system have appeared, and of finding ways and means of correcting them.

Much of the discussion of land tenure problems has been confined to a consideration of the problems of farm tenancy. This has probably been due to the growing importance of tenancy as a phase of tenure problems or to the belief that farm tenure problems are to be solved largely by a correction of the difficulties of farm tenants. It must be emphasized, however, that farm tenancy represents a limited part of the whole field of tenure problems and that tenure problems cannot be solved by a consideration of farm tenancy alone.

The most striking feature of the tenure system of the United States and Canada is not so much the alarming growth and the problems of tenancy as the feature which has often been called the "breakdown" of ownership. The tenure problem does not seem to rest so much on the fact that tenancy is increasing as upon the fact that operating ownership is decreasing and at the same time becoming less desirable.

The implications of such a "breakdown" in ownership can be appreciated when the position of ownership in a developed tenure system is realised. Owner operation has been regarded not only as the most desirable form of tenure from the standpoint of the nation, but also as the form of tenure which is desired most by the majority of cultivators. Other forms of tenure, particularly farm tenancy, have been considered to exist only in so far as they are incidental to the achievement of owner-operation.

The process by which owner-operatorship is to play a dominant role in the tenure system is contained in the concept of the "tenure ladder." Farm labourers and farm youths desiring to farm are to become tenants

as an intermediate step in becoming farm owners. Tenancy is to be used as a means of building up capital for the eventual purchase of a farm. Farm owners who assume indebtedness in the purchasing of farms are to be able gradually to consolidate their holdings and become debt free owners.

The "breakdown" of ownership as the basic concept of the present tenure system has appeared at a number of points. Ownership has not proven to be the most desirable form of tenure for all operators. Many tenants at the present time prefer to remain as tenants and many operators who are owners at present would like to be tenants. At the same time there are tenants who would like to become owners but have been unable to do so because of insufficient capital and opportunity, and there are groups of labourers and farm youth who desire to start farming but have been unable to get past the stage of being hired farm workers. In other cases the "ladder" process has been reversed and operators have had to abandon ownership or tenancy and become tenants or farm labourers. This has given rise to the frequent suggestion that the "tenure ladder" is lying down and its participants are walking between the rungs, or that the "ladder" has now become a toboggan slide.

It would seem that one of the basic problems in land tenure is to decide how far the concepts of operator ownership and the "tenure ladder" are consistent with the concept of a desirable tenure system. Conceivably a system of complete owner-operation is impossible. As long as the present methods of land ownership and disposal are continued there will be lands owned by individuals or institutions having no intention of farming them. Similarly, as long as there are people desiring farms who cannot become owners immediately there will be some non-owning operation of farms. A certain amount of non-owner operation and absentee ownership is not only an inevitable but also a necessary part of the tenure system.

In a mature and stable tenure system there should conceivably be a fairly regular succession of tenancy and ownership, and the amount of tenancy should bear a fairly consistent relation to the amount of owner-operation. Retiring owner-operators will be replaced by tenants who are becoming owners, and tenants will in turn be succeeded by farm labourers and farm youths who are starting farming. The lands made available by the discontinuance of older operators, will, through the various processes of inheritance, purchasing and renting, be taken over by a new generation of operators.

If the concept of a tenure system operating in this way is held to be tenable, the basic tenure problem consists of finding means of making it operate successfully. The growth of tenancy in the United States and Canada in recent years has been suggested by some to indicate that owner-operation is no longer desired as a form of tenure and will eventually be largely supplanted by tenancy and non-owning operatorship. If this is the case the objective of tenure policies could be confined to promoting the most desirable conditions for tenant operation. On the other hand it seems more correct to suggest that the increase in tenancy is evidence, not of a declining desire for farm-home ownership, but of difficulties in the tenure system which have prevented operators from becoming owners.

Many present-day tenants are "unwilling" tenants in the sense that they would sooner be owners, while a large number are "willing" tenants only because the prospects of ownership at the present time are uncertain or not fully desirable.

Assuming that the desire for ownership is still the dominant desire of the large group of farm operators, the main tenure problem is that of making the status of ownership more desirable and making it more easily accessible by removing the obstacles in the working of the "tenure ladder." The secondary problems would then consist of improving the status of other tenure groups together with promoting policies which have a beneficial effect for farm operators as a whole.

The most undesirable feature of farm ownership in recent years has been the insecurity arising out of indebtedness. Many farmers became owners by assuming a heavy burden of debt, while other owners assumed indebtedness in expanding the size of their holdings. Much of this indebtedness was contracted in periods of good yields and relatively favourable prices. Ineffective credit policies often induced farmers to undertake excessive purchases. Inflated land values created through speculation and a lack of conservatism left many owners with debts too great for the productive capacity of their farms. When prices and land values fell the equities of many operators disappeared. Some owners were forced to abandon ownership while others continued in a precarious status of ownership.

The result of this situation has not only been that of leaving many owners insecure and dissatisfied in their tenure but it has also disrupted seriously the normal process of the "tenure ladder." High land values have prevented tenants from becoming owners after a normal period of tenancy and now many of these tenants prefer to remain as tenants because ownership no longer offers much inducement to them.

The slowing down of progress in ownership has led to a further difficulty in preventing the normal retirement of operators after a satisfactory period of ownership. The lands made available by the retirement of older operators are usually passed on by sale, inheritance or renting to a new group of owner and tenant farmers. In recent years, the low incomes of farms have induced farmers to continue farming longer than they would otherwise have done. At the same time the sale prices and rentals of farms have not been high enough to provide a satisfactory retirement income to their owners. As a result there has been a damming back of farmers in ownership which has prevented other groups of operators from reaching a higher scale on the "tenure ladder." This damming back of operators in the various tenure groups has been accentuated at the lower end of the "tenure ladder" by the increased number of people who desire to become farmers because of the lack of non-agricultural opportunity.

The reconditioning of ownership as the most important part of the tenure process presents an especially difficult problem at this time. Not only does it seem necessary to revive a normal desirability of ownership, but also to provide additional incentive and movement to ownership to take care of the damming back which has occurred. What constitutes a normal complement of ownership in the tenure system has not yet been

decided. The removal of the present undesirable features of ownership by adjusting the indebtedness of farms and increasing the security of owners represents a major problem. Coupled with this problem is the difficulty of maintaining the desired degree of ownership once it has been established. This consists of finding means of preventing land values from fluctuating too severely and of preventing farmers from assuming indebtedness beyond their abilities to carry it. These difficulties cannot be solved entirely by the development of effective credit policies and the extension of public control. However, the development of satisfactory methods of acquiring and paying for land and of servicing mortgage indebtedness would do much towards improving the ownership process. In the wider field of agricultural problems, the development of satisfactory conditions for ownership depends upon maintaining the income of agriculture and upon developing non-agricultural opportunities to release the pressure of the farming population on the tenure process.

The reconstitution of farm ownership would remove many of the present difficulties of non-owning tenure groups. The restoration of a desirable and necessary degree of tenancy would result in a larger proportion of "willing" tenants as contrasted with the large group of "unwilling" tenants which exist at present. The renewed hope of ownership and an increased movement towards ownership would stimulate the whole process of the "tenure ladder."

On the other hand, there are specific problems of tenancy which would remain. Some attempts at solving the difficulties of tenants will be necessary, not only to make tenancy a more desirable part of the tenure process, but also to make it more effective as a process of attaining ownership.

A system of farm tenancy in itself cannot be considered harmful or undesirable. The agricultural tenure of a number of countries is based on the successful operation of a tenancy system. The undesirable features of tenancy represent defects in the application of tenancy in a particular tenure process.

The distinction between "desirable" and "undesirable" tenancy is a difficult one to make. Some forms of tenancy are considered quite as desirable as ownership. Most important of these is the "related" tenancy in which the operators of rented lands are related to the owners of such lands. Tenancy under these circumstances usually represents an intermediate stage in the eventual inheritance or purchase of the rented farms. The more significant feature of American tenancy, however, has been the preponderance of "undesirable" tenancy. This type of tenancy exists when tenants are unwilling to be tenants and when their relations are such that they cannot and do not operate as successfully and desirably as owner groups.

The problem of tenancy consists in creating the desired degree of "desirable" tenancy. Much of the "undesirable" nature of tenancy arises from defects in leasing arrangements and the framework of landlord and tenant relationships. Given a satisfactory leasing arrangement, with a reasonably satisfactory relation between landlord and tenant, together with a reasonable assurance of attaining ownership, most of the undesirable qualities of tenancy would be eliminated.

The improvement of leasing arrangements is of real significance in Western Canada. The type of farming and the temporary nature of leasing have promoted types of rental and leasing arrangements which are not fully adjusted to leasing conditions. A surprising laxity in leasing arrangements has been found. Lessees renting lands as part-owners or tenants have not taken adequate care in drawing up lease contracts and in arriving at a satisfactory leasing arrangement for their individual farms. A large number of lessees operate without a written and formal leasing contract. Another large group of lessees know little about the contracts which they have signed. Most of the lease contracts represent standard lease forms printed by stationery companies or by mortgage lending companies having a landlord interest. Few of these leases contain insertions of clauses designed to modify the lease for particular parcels.

A particular defect of leases is the inadequacy of clauses designed to protect the security of lessees. A large proportion of the leases provide a one year leasing term. Little provision is made for a satisfactory period of notice to lessor or lessee for the termination of the lease. Most lessees hold their lands subject to the sale of the farm and the period of notice in case of sale is usually limited.

Additional protective clauses of leases, providing for the adjustment of rentals in case of crop or price failure, for compensation for improvements made by tenants and for proper farming and cropping practices are absent from most leases. All these factors have contributed to the alarming insecurity of tenant farming, the gradual deterioration of rented farms and to a generally unsatisfactory status for farm leasing.

A further defect in farm leasing arrangements is represented by the lack of adjustment of rental terms to variations in renting arrangements. The crop-share rental has been used almost exlcusively throughout most areas of Western Canada. Very little variation in the share-of-crop rental exists for different soil and type-of-farming areas and for farms of different sizes and different degrees of improvement. Custom appears to have played a dominant rôle in determining rental terms and in many cases such terms have made a satisfactory leasing arrangement impossible.

The promotion of satisfactory leasing arrangements cannot be accomplished entirely by the development of more complete leasing provisions. The legal framework in which leasing is allowed to operate is only partly responsible for the manner in which leasing arrangements will finally function. Much depends upon the personal and individual relations of lessors and lessees in their renting arrangements.

In this respect the problems of tenancy are related to the problems of landlordism. Some of the difficulties of present day tenancy have arisen from the types of landlordism which have developed, and from the difficulties which landlords themselves have experienced. A number of landlords at present represent "unwilling" landlords who are holding lands in absentee ownership merely because conditions for their disposal have not been satisfactory. Companies and individuals have acquired lands by foreclosure, and other non-farming individuals have acquired lands by inheritance and purchase. The normal processes of disposing of these lands have been interrupted and they have been rented pending eventual sale.

The attitudes of such landlords in supervising their leases have not been conducive to satisfactory leasing arrangements. The unwillingness to make improvements has strained the relations of landlord and tenant. The objective of selling these lands whenever opportunity arises has lent a serious instability to farm leasing. Part of the tenure problem consists in preventing the appearance of undesirable forms of landlordism.

For landlords who may be classed as "willing" landlords, the difficulty of maintaining a satisfactory income from rented lands has also created a problem in farm leasing. Rentals have not always allowed landlords to support themselves from their rented lands. Some landlords have been obliged to resume operation and others have sold their properties in order to obtain needed finances. Few landlords have been able to make desired improvements on their properties or to aid tenants in the operation of the farm.

The present discussion has been concerned mainly with outlining the problems of ownership and tenancy in the present tenure system. It has omitted from consideration a further important tenure group, namely, those people who desire to become farmers but who have not yet been able to acquire land to start farming. The problem of farm labourers and of young people desiring to farm is related closely to the tenure problem and to the problem of finding satisfactory opportunities in non-agricultural employment.

Also, the discussion has omitted to consider many of the wider problems which are affecting most tenure groups to a greater or lesser extent. The promotion of more desirable uses of land under the present system of land ownership, the extension of public control in land ownership, the development of more effective credit policies, the provision of a larger and more stable income for agriculture, and the development of rural social life are all problems which relate to farm tenure.

It is impossible in this space even to indicate the directions which solutions to some of these problems should take. The first step, however, must be a recognition of the full extent of the tenure problem. This can be accomplished only by a complete study of how the tenure system has functioned in its present form.

PRACTICAL DIFFICULTIES IN THE DEVELOPMENT OF A SCIENTIFIC LAND POLICY: MANITOBA[1]

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The major problems of land use in Manitoba are associated with two persisting conditions: (1) involuntary land acquisition through tax delinquency in certain of the older settled areas, and (2) the uncontrolled extension of settlement on the agricultural fringe. We have been aware of these problems for some time. In 1926 an economic survey of the unused lands of the Province was made and recommendations as to best land use were presented for districts which, even under the relatively favourable price structure of that time, were considered critically marginal or sub-marginal.[3] At various times since then, Agricultural Committees of the Legislature have paid particular attention to problems associated with land use, but not until 1939 were proposals made by the Government for necessary action.

LEGISLATIVE ACTION

In order to extend the work of Prairie Farm Rehabilitation into southwestern Manitoba, it was expedient to pass enabling legislation which would give municipalities the authority to expropriate lands, exchange lands, regulate and control tillage practices, and do many other things deemed proper to rehabilitate any drought or soil-drifting area of the Province.[4]

During the drafting of this bill the Minister of Agriculture gave serious consideration to the possibility of making this a measure which would embrace all of the Province, so as to provide wide powers for land use control, including zoning. This idea was dropped for several reasons. The urgency for legislation to assist Prairie Farm Rehabilitation developments prevented a thorough study of broader applications. The Department of Municipal Affairs, although convinced that control of land use was fundamental to the solution of many of its problems, believed that municipal authorities, outside the drought area, were not convinced of the necessity for action. Finally it was successfully argued that, while in the drought area Dominion funds were available to develop projects of controlled use, there was no possibility at this time of appropriations being made for projects elsewhere.

Probably of more unique importance and interest to this group, is an unproclaimed law now on the Statutes of Manitoba (S.M. 1939, C. 13) entitled "An Act to amend 'The King's Bench Act' to establish a Land Court Division of the Court of King's Bench". Interpretation of the need, purpose and powers of this Act cannot be entered into at this time. Suffice it to say that Provincial Debt Adjustment Legislation in Manitoba only

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[1] Address delivered before the Twelfth Annual Meeting of the Canadian Agricultural Economics Society at the University of Manitoba, Winnipeg, Man., June 20–21, 1940, held in conjunction with the Twentieth Annual Meeting of the Canadian Society of Technical Agriculturists.

[2] Assistant Professor of Political Economy.

[3] Murchie, R. W. and H. C. Grant; "The Unused Lands of Manitoba." King's Printer, Manitoba, 1926.

[4] An Act to provide for the Rehabilitation of Drought Area Soil-drifting Areas in the Province (S.M. 1939, C.36).

postpones the evil day, and the Farmers' Creditors Arrangement Act of the Dominion Government is not now operative in Manitoba (as at May, 1940).

In order to provide a substitute for the F.C.A.A. in Manitoba and strengthen the considered weaknesses of that measure, the Land Court proposal was drafted, after very careful consideration, by a special committee of investigation. Critics of the F.C.A.A. contend that it makes a clean-up once and for all of the farmers' debts without due consideration being given to constructive plans, by which a farmer could hold his farm and carry on under such supervision as would enable him to earn an income sufficient to provide security for himself and greater equity to his creditors. In other words, the farmer came through the Farmers' Creditors Arrangement Act a bankrupt. Before the Land Court he would appear as a distressed debtor seeking time and supervision to fulfil a reasonable compromise of his just debts.

Under the proposed Manitoba Land Court, the compromising of debt is associated with the definite purpose of maintaining the farmer as a good credit risk.

After this brief survey of the legislative aspects of land policy, we may now consider this subject in its broader applications.

GENERAL PROVINCIAL POLICY

There may be some disagreement as to the ideal pattern to follow in developing a scientific land-use policy. There is no flood-light of revealed knowledge illuminating the problems of our western agriculture. Institutions and individuals are moving over the field with candles and lanterns. Even the most pessimistic of us will admit, however, that the pace of our activities has quickened in the last few years, and the charts we follow have more points of reference, not the least being the fact that the theory and practice of land valuation have been studied anew with stimulating clarity and vigour.

In this paper, scientific land policy is considered to consist of an organized and carefully analyzed body of facts, upon which positive action can be taken. Thus defined, we many consider some of the obstacles to the achievement of this purpose. Methodology and purpose of land economic research will not be discussed. We will probably all agree that no matter how much we may desire to do research for its own sake, funds have not been readily available, and will probably be provided only in smaller amounts in the immediate future, unless the problems to be studied are a serious threat to vital aspects of our economy. Evidence in support of this view may be found in the relatively generous financial encouragement provided for the breeding of rust resistant wheat, for laboratories to study animal and plant diseases, and for the attack on the drought problem. Governments, with drastically reduced incomes and enlarged demands for human relief and social services, must be excused if they are willing to support only those programs and policies that show promise of mitigating the force of disabilities which affect the amount, and the stability, of the regional income. Within limits we have received generous support in Manitoba for any projects designed to increase our knowledge

of the character, extent, and best use of our natural resources. Our tax-delinquent and unused lands have been located and mapped. Areas of rural distress have been located and their general problems outlined. An intensive study of one of these areas made jointly by the Department of Soils and the Department of Economics of the University of Manitoba, was projected and completed for the Municipal Commissioner who desired positive recommendations as to policy.[1]

While the policy of the Government of Manitoba in supporting economic research is realistic and positive in the short run, and has a general long run direction, it lacks a great deal in coherence, suffers from lack of continued effort, makes heavy additional demands on the mental and physical resources of men usually engaged full time in other work, and does not build up and hold a trained and permanently employed staff. The present government recognizes these defects, but sees no way under existing circumstances of providing a remedy. This is the background upon which a land policy, based on a comprehensive knowledge of the facts, must be plotted.

Inadequacy of Soil Data

Another practical difficulty in Manitoba is that, except for the special soil reconnaissance survey made for our Armstrong study last year, soil maps are not available for the major land problem areas of the Province. Our acute and chronic problem areas are on the northern and eastern fringe of settlement, while our soil investigations have been made in the southwest as part of the rehabilitation program for the drought areas. As a result of more adequate knowledge of the physical factors in the southwestern area, community pastures have been established and local agricultural improvement societies organized to promote cropping practices best suited for particular soil types. This is all to the good, but these programs are far removed from the districts of arrested development or retrogression.

Under present circumstances "land policy" needs are directly associated with the breakdown of local government in certain well defined sections of the Province.[2] Over a period of years tax-delinquency has become epidemic; tax sale properties have reverted to the municipality; and finally, in many cases, local government has broken down. During this process contributions from the Provincial Treasury to maintain local services of schools, health and roads, have steadily increased. The total Dominion and Provincial grants (including relief) for 11 municipalities and unorganized territory in the interlake area for 1937 was half a million dollars. Under such circumstances provincial authorities may well be alarmed, and in Manitoba they are deeply concerned and want to know what are the fundamental causes underlying the problem and what may be done about it.

But this is not all of the picture. So called "back-to-the-land" settlers have been taken off city relief rolls and placed largely in areas of distressed local government. At the same time settlement is being extended

[1] "Physical and Economic Factors relating to local Government in Distressed Rural Areas." Economic Research, Project No. 2, King's Printer, Manitoba, 1939.

[2] See "Agricultural Income and Rural Municipal Government" report of the Economic Survey Board Manitoba, 1939.

in the bush lands on the eastern fringe and adjacent to the Pre-Cambrian. With little more than their hands this last group ekes out a living for a few years from the sale of cordwood. Where they burn off the swamp spruce and peat, to reveal in most cases a sandy unfertile soil, a definite fire hazard emerges, in some instances causing great loss; and all that is left is a scattered settlement of subsistence farmers.

One would conclude from this that there is no argument left for the continuance of such unwise settlement and land-use policies. But such is not the case. Neither the Provincial Government nor the University has the funds to conduct soil surveys in these areas. But supposing funds and men were available, are particularized soil maps and land-classifications a prerequisite for positive action directed towards controlling present and future use of land in these areas? Experience in Northern Minnesota shows that a well directed policy of resettlement and land-use control can be effected and should be undertaken without awaiting the completion of detailed soil surveys.[1]

I am convinced that positive action will have to be taken in Manitoba before detailed soil surveys are made. If we are to be realistic and helpful, what should concern us most is not academic statements of ideal policy, but constructive suggestions that will assist municipal and provincial governments to make wise decisions from time to time within the limits of their immediate powers and financial circumstances. But economists, like doctors, are seldom called on as preventive practitioners. Routine decisions of various governing units are from day to day creating new land-use policies or perpetuating old ones. When the economist, as a result of research, suggests a new approach, his recommendations are too often buried under a pile of institutionalized procedure, or fail to break the barriers of conflicting governmental jurisdictions.

LAND POLICY CONCEPTS AND SPECIFIC DETERRENTS TO ACTION

In order to reveal these difficulties in a more concrete manner I shall attempt to relate them to some accepted concepts of scientific land policy. Such a policy would include, among other things:—

1. *Readjustment of Taxation*

Farmers are more interested in land policy as a means of revaluing land to lower levels, and thus relieving them of the burden of taxation. Municipal governments are usually disinterested or opposed to land policy programs because they fear a constriction of their tax base. Land branches of provincial governments are not very enthusiastic because up until recently the only policy in which they have had experience was the sale of Crown lands. The land problem now reaches the government through the Department of Municipal Affairs, where officials see the need for positive action, but hesitate to make recommendations on a matter which technically belongs to the Department of Natural Resources or of Agriculture.

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[1] Jesness, O. B., R. I. Powell and associates, "A Program for Land-use in Northern Minnesota." University of Minnesota Press—Minneapolis. 1935.

2. *More Effective Handling of Tax Reverted Land*

The present policy of municipal authorities is to sell tax reverted land as quickly as possible for as much as possible, regardless of its relative productivity. We have innumerable records of such lands changing hands over 5 times in the last 15 years. For a chronic and widespread condition of this kind a rather drastic solution has been suggested. It is to permit farmers adjoining such lands, who now have insufficient acres to practise efficient livestock farming, to rent such land on a long time lease at a very nominal rent. If such a lease be granted, the farmer must accept supervision of his entire farming operations from the district agricultural representative. In other words, he would be put under a modified type of farm-management similar to that now exercised in many cases by mortgage companies, except that in this instance the purpose is to get the farmer on his feet to pay taxes, rather than to pay mortgage principal and interest.

3. *Zoning of Undeveloped Areas*

Particularly in southeastern Manitoba, settlement is pressing on the forest reserve; fire hazards have increased and water sheds have been endangered, with only a problematical gain from an increase in the number of subsistence farmers. The state of provincial finances has prohibited proper supervision and management of a larger forest reserve, and the threat of an increase in town and city relief from surplus rural population has caused such settlement to be ignored, and in some cases encouraged. Classification and zoning is of course the only solution. Land-zoning legislation has been successfully applied in the northern lake states of the United States. However, two conditions were operative in areas which the writer has visited which are not found in Manitoba. The first is that the land zoned out of agricultural use was on the periphery of a relatively high producing core, which core was providing a taxable income sufficient to support local government. The sub-marginal area in this case is in the nature of an obligate parasite on county government. In Manitoba much of the land to be zoned out of use is saprophytic. We have practically no area, where land-use problems are acute, that has a central zone of high production whose residents are anxious to be given power to divest themselves of a sub-marginal farming district. It is a case of dire need in the midst of general distress.

The other factor operative in the United States but absent with us, is that the Federal Government gives directional assistance of various sorts and financial aid to zoning projects.

4. *Purchase of Land in Distress Areas for Non-agricultural Use*

It has been suggested above that zoning demands purchase and resettlement. Who is to provide the funds for this in Canada? I do not know. Certainly the Province has not the means, and apart from the financial difficulties of the Federal Government as a result of the war, one must admit that after clamouring for control of our natural resources,

and having administered them for some 10 years, it may be termed pure beggary for a province to ask the Dominion Government to buy back the poorest of its land assets and spend money on them for recreational or forest uses. And yet I see no alternative if an adequate land policy is to be consummated.

5. *Local Government Re-organization*

As far as Manitoba is concerned our land problems lie mainly in areas where local governments have broken down. Local government has broken down because, either the soil is too poor to support local taxation and/or farming practices are not based on the best use of the soil resources, such as they are. Where local self-government disintegrates, the practice is to permit disorganization of the municipality and to place local administration in the hands of an official of the Department of Education, who collects such taxes as will pay, in part, only for the educational services.

This is far from being an adequate policy. It makes no provision for a concerted program to rehabilitate the area. The lands which the now disorganized municipality possess as a result of tax delinquency, receive little attention, whereas they could provide the basis of a new land policy which would be directed towards enlargement of the holdings of present operators, the establishment of community pastures, or closer settlement through relocation; if unsuitable for any of these purposes they would be definitely blocked off as non-agricultural.

This leads to the final aspect of an adequate land policy.

6. *The Development of Public Opinion*

In the last 10 years there has developed a growing awareness on the part of the public with respect to land policy. As a matter of fact I had come to the conclusion some time ago that individuals representing organized bodies interested in western agriculture were far more aware of the need for, and the problems associated with a land policy, than were the elected and administrative officers of government. Outside of the P.F.R.A., land economists have been largely working in a vacuum. As far as I know, there is no branch in any federal or provincial government which has an appropriation for the direct development of land policy. That is not to say that research is not being done nor that administrative officers are not now thinking about wise land use. In my opinion, however, governments as a whole, have been little concerned. There can be no substitute for cabinet-ministerial thinking in this matter.

When constructive thinking finally leads to action, I trust that land policy will be co-ordinated with, and be part of a planned program for the development and conservation of all our natural resources. One of our major practical difficulties at present is that forestry, water conservation, wild life conservation and land settlement are all considered as separate and distinct lines of endeavour. Experience should have proven that this

concept is fallacious. We can only hope that in the future the error will not be repeated. The age of exploitation in Western Canada is gone. We must have unified conservation of our resources or see every aspect of our economy shrivel before our eyes.

In conclusion may I direct your attention to the "Report of the Royal Commission on Dominion-Provincial Relations" Chapter II, Book II, entitled "Avoidance of Overlapping and Duplication". While we may not agree as to the specific allocations of agricultural activity suggested by the Commissioners, their recommendations deserve serious consideration. Apart from soil surveys, no specific suggestions are made as to land policy. They do state, however (page 130, Book II), ... "conservation work in general has been seriously neglected . . . ." But when they say "it is always easier to continue traditional services than to make innovations"; and later on . . . . "the waste due to outmoded, redundant or misdirected activities involves much larger amounts than any physical overlapping between services of different governments", I trust that this group most heartily concurs.

THE THEORY OF FARM LAND VALUATION[1]

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In the study of farm land valuation the first duty of the economist is to measure the various causes of value, or factors affecting value, and their effects. Regardless of any preconceived notions of how various factors should affect value, an earnest effort should be made to discover how various factors do affect value.

In the beginning it should be taken for granted that the value of a farm is an exchange value or an estimate of what an exchange value would be. Exchange values are determined by the social process of the market, in which those who have farms and those who want to buy farms meet and bargain. The price which a buyer first offers for a farm, and the price below which an owner first thinks not to sell, may in particular cases have in them an element of deliberate calculation, as for example, a capitalization of an estimated income. However, in evidence upon which to calculate and in ability to make use of the same, individuals differ; and furthermore, if bargains are to be struck, compromises must be made, and all kinds of seemingly personal and irrational wants and other feelings help settle upon the final price. The price at which other comparable farms are selling will influence, as much as anything, the price thought proper for a given farm. The upshot is that the price of farms is the result of a mass psychological process, just as is the price of wheat, in which latter no intellectual capitalization process could possibly have any part.

Although the price of wheat is determined by a mass psychological reaction, on which conscious intelligence has little influence, statistical studies have shown that the results of this process vary in obedience to definite laws, according to which the price is affected by changes in the supply of and demand for wheat and the medium of exchange. In other words, mass psychology, while not rational in itself, appears to operate according to principles which appear reasonable once they are brought to light.

Statistical studies of factors related to the value of farms have likewise uncovered evidence of certain principles which, although they may seem strange at first sight, will become reasonable when intimately known.

The results of these studies do not, and by definition could not, indicate the over-valuation or under-valuation of whole classes of farms. They simply show some of the factors by which the mass mind is influenced in determining measurable values, and they probably do not furnish any basis whereby the disposition of the mass mind may be influenced in any way.

Besides the statement already made, that the value of farm land is an actual or estimated exchange value, certain other axiomatic propositions may be offered. These are not preconceived notions in the sense used at the beginning of this statement, because they have been formulated under the influence of the statistical studies that were mentioned. The first is that the unit on which agricultural income is earned and agricultural capital

[1] Address delivered before the Twelfth Annual Meeting of the Canadian Agricultural Economics Society at the University of Manitoba, Winnipeg, Man., June 20–21, 1940, held in conjunction with the Twentieth Annual Meeting of the Canadian Society of Technical Agriculturists.

Figure 1. PERCENT OF TOTAL FARM PROPERTY IN LAND, BUILDINGS, MACHINERY AND LIVE STOCK, UNITED STATES CENSUS OF 1930

In different regions farm capital accumulates in different forms.

is accumulated is the farm, and not the acre. The farm consists of land, buildings and other improvements, live stock, tools and a stock of supplies; and the total value of the integrated whole is the value of the capital of the farm. Under different conditions of topography, climate, soil and position with respect to markets and sources of supply, the capital which accumulates on farms varies according to the proportion which is in the different forms.

This is illustrated by the accompanying map showing proportions of capital represented by land, buildings, live stock and equipment on farms in different parts of the United States (Figure 1). In the far Northeast, where humidity is generally high and winters are long and snowy, buildings are a high proportion of farm capital. Toward the West, as the climate gets dryer, and toward the South, as it becomes warmer, the proportion of capital in buildings gradually decreases. In the Mountain States, much of the capital is in the form of herds of live stock. In seeking the relation between income and capital in agriculture, no standard relation between income and the value of farm land alone, or even of farm real estate alone, need be expected. If there is any standard relation, it is between income and the total value of the farm capital.

The farm should also be thought of as a limited portion of the earth's surface from which certain workers are attempting to obtain an income for their families. The workers dependent on the farm perform three principle functions, namely, physical labour, management, and ownership.

The function of ownership is to provide and maintain, against other demands and against all ravages, the capital of the farm. The operator makes use of the capital provided, and directs the physical labour. In practice, the three functions usually are not performed by separate men. One man may own and operate a farm without using the labour of any other person, thus performing all three functions. Even on a tenant farm, the operator may own a part of the capital, and the landlord may assist in the management. Hired labourers also effect management by suggestions and by their own varying skill. From these observations it may be concluded that, although the value of a farm doubtless has a relation to the income afforded the owner of capital for his year's work, this income cannot in many cases be identified with the income received by any one person. It must be regarded rather as the income allotted to various persons for the performance of the function of providing capital.

Corollaries to the preceding statements are, first, that the combined income of those who perform the three primary functions of farming is limited by the resources of the farm; and second, that each function must receive an income, or else the farm will not remain occupied as a farm. As long as any income at all is being received on a farm, some part is being directed toward the provision and maintenance of capital, and the farm has a value. The problem of the analysis of value thus becomes that of determining the proportion of the income that is directed toward the function of maintaining capital, and the factors which affect that proportion.

Of course, market prices of farm land depend on anticipated shares of income that will be available for the maintenance of capital. Individual farms that are not actually in operation, and unorganized tracts of land,

have market values based on anticipated or potential income, the mass estimate of which is based on current and recent past experience with similar land in actual operation. Any land, therefore, on which any gross farm income could be earned, will always have a value.

Since all of the three functions (labour, management, and ownership) are essential to the existence of a farm, it might be assumed that the average income for a year's work in any one of the three capacities on any particular grade of farm would be equal to that earned in either of the other two capacities. If a higher income is allotted to a man for a year's labour in one capacity than is allotted to him for a year's labour in another on the same farm, the difference and not the equality must be explained. At least, the fact that the three functions must all be reimbursed from the proceeds of a limited area must exert a powerful influence toward keeping the reimbursements equal, and it would therefore be highly unwise, in attempting to arrive at the reimbursement to the owner of capital, to subtract from the total dividend due the three functions any wage for labour and management that would be standard for all grades of farms. One should be prepared to distribute the dividend available on each grade of farm into shares, which would never be zero for any of the three functions.

Legal laws and economic customs often reflect, though imperfectly, economic laws which are universal, and which would be effective under any set of social institutions. (Modern Economics, by the way, has tended, deplorably, to forsake the study of principles for the study of institutions.) Among the customs reflecting the tendency for the income available for all the farm functions to be divided among them, and not to be disbursed by subtraction in a particular sequence, is the widespread practice of renting on shares. In the mortgage field, also, where the owner of part of the capital is known as a creditor rather than a landlord, flexible payment plans and other devices are introduced in times of stress to preserve the normal division of farm proceeds among those who contributed to their production as owners, labourers, and managers. If these devices are inadequate, liquidation of contracts eventually follows.

The foregoing generalities, and others that will be mentioned, have had their origin, first, in the body of general farm management research, with the results of which they are believed to be in agreement. Secondly, and more specifically, they have been derived from statistical studies of farm business data based on economic land class maps.

Economic land class maps, such as those being made by the New York State College of Agriculture at Cornell and by a number of other State Colleges of Agriculture, divide farm land areas within counties into classes according to the relative intensities of use to which they are adapted, a practical expression of their economic productivity. The land classes measure the relative opportunities for farm people to earn incomes and accumulate capital on farms in different areas within counties.

It is difficult here to avoid entering into a discussion of the theory of land classification, because such a discussion is necessary and proper to a complete coverage of the subject in hand; but time will not permit. Suffice it to say that differences between farm land areas with respect to the economic productivity of an acre of land are of two different kinds, regional and

local; that regional differences may be offset in a large degree by variation in the number of acres per farm, so that incomes per man are equalized as between regions; but that local differences, as within counties, cannot thus be equalized, and continue to be expressed in the productivity and therefore in the value of farms, as well as in the productivity and value of an acre. Land class areas are at least as large as the farms in the district that has been mapped, and they represent grades of land from the standpoint of the farm as an economic unit. By their use it has at last been possible to study the relation between income and value on different grades of land.

In connection with land class studies, individual farms are classified by inspection as poor, fair, good, very good, and excellent, based on the apparent amount and condition of the farm improvements and other capital. This preliminary process amounts to an economic land classification on an individual farm basis. In two counties in New York it was observed that the *labour returns per worker* on each grade of farm were approximately equal to 5% of the value of the total farm capital. The

TABLE 1.—RELATION BETWEEN LABOUR RETURNS PER WORKER AND TOTAL FARM CAPITAL ON FIVE CLASSES OF FARMS IN BROOME AND CORTLAND COUNTIES, NEW YORK, 1936*

Class of farm	Number of farms	Number of workers per farm	Labour returns per worker	Total farm capital	Returns as per cent of capital	Returns capitalized at their average per cent of capital	Capitalized returns as per cent of actual capital
			$	$		$	
Poor	23	1.6	217	5,049	4.30	5,191	103
Fair	52	1.7	343	9,633	3.56	8,206	85
Good	54	2.3	636	13,229	4.81	15,215	115
Very good	51	2.8	734	20,986	3.50	17,559	84
Excellent	4	3.6	1,274	27,948	4.56	30,478	109
				Average	4.18	Average variation from 100:	11.6

TABLE 2.—RELATION BETWEEN LABOUR AND CAPITAL RETURNS PER MAN AND TOTAL FARM CAPITAL ON FIVE CLASSES OF FARMS IN BROOME AND CORTLAND COUNTIES, NEW YORK, 1936*

Class of farm	Number of farms	Number of men per farm	Returns per man	Total farm capital	Returns as per cent of capital	Returns capitalized at their average per cent of capital	Capitalized returns as per cent of actual capital
			$	$		$	
Poor	23	2.6	216	5,049	4.28	4,943	98
Fair	52	2.7	394	9,633	4.09	9,016	94
Good	54	3.3	673	13,229	5.09	15,400	116
Very good	51	3.8	807	20,986	3.85	18,467	88
Excellent	4	4.6	1,266	27,948	4.53	28,970	104
				Average	4.37	Average variation from 100:	8

* Adapted from a thesis by MacArton, for the degree of M.S., Cornell University, 1939.

labour returns per worker were calculated by subtracting 5% of the value of the capital from the total returns available for the operator, paid and unpaid hired men, and the owner of the capital, and dividing the remainder by the number of workers including the operator. Data for one county were for 1927, and for the other were for various years from 1910 to 1914. Since 5% was about equal to the mortgage rate of return on capital, the data pointed to the conclusion that the return to the owner of capital on each grade of farm was equal to the average wage of labour and management on the same grade. These observations thus lent support to the idea that the function of the ownership of capital shares in the returns on each farm in the same way as does a year's work in other capacities on the same farm.

Under the circumstances it seemed probable that if a *returns per man* were calculated, by dividing the total dividend available for labourers, the operator, and the owner, by the total number of actual workers plus one to represent the owner of capital, the resulting measure would bear an even less variable relation to total capital on different grades of farms than had the *returns per worker*. This idea was tested by MacArton, using data for Broome and Cortland Counties, New York, for 1936, and found to be correct (Tables 1 and 2). This new social measure of returns, named in full, *capital and labour returns per man*, differed as between grades of farms in approximately the same ratio as did the total value of the farm capital.

It should be noted at this point that the calculation of *returns per man*, unlike that of *labour returns per worker*, does not involve any assumption as to the market rate of interest on farm capital. The measure is derived strictly by a sharing process. Since it seems to be the measure of net returns which varies from one grade of land to another in the same ratio as capital, its average relation to capital on all grades of land probably is the real interest rate. In other words, this rate probably is the rate by which the net income available to the owner is capitalized into the value of the total farm capital.

MacArton's study also contributed an entirely new observation, namely, that the total labour expenses per farm tended to vary from farm class to farm class in the same ratio as did total capital. This observation has led to new discoveries in later studies.

Another interesting fact, observed in every area so far studied, was that the number of workers per farm increased as the grade of farm rose. This means that a highly productive grade of farm, supporting 4 men at an average of $1000 each, was valued only twice as high as a lower grade of farm, supporting only 2 men at $500 each. At first thought the relation seems unreasonable, but not at second thought. The owner derives no benefit from the incomes received by other functionaries on the farm, be they many or few, but maintains only the value of capital that his own reimbursement will afford.

The higher the productivity of farms, the greater the number of people supported by them and the higher the income received by each person; but the owner is only one of the beneficiaries, and a higher farm value is only a partial manifestation of the increased productivity as it affects the whole population.

TABLE 3.—MEASURES OF NET FARMING RETURNS, IN FOUR LAND CLASSES, FREDERICK COUNTY, MARYLAND, 1938

Net returns	Land class II	Land class III	Land class IV	Land class V
Labour income	−$ 4	$ 300	$ 828	$ 2,159
Returns to capital	− 58	469	1,218	3,050
Labour expenses	148	435	889	1,107
Labour expense per hired worker	296	435	494	554
Labour returns per worker	96	368	614	1,089
Capital and labour returns per man	127	409	663	1,152

TABLE 4.—ESTIMATES OF TOTAL FARM CAPITAL IN DIFFERENT LAND CLASSES OBTAINED BY CAPITALIZING VARIOUS MEASURES OF RETURNS AT THEIR AVERAGE RATES FREDERICK COUNTY, MARYLAND, 1938

Measures of farming returns	Rate of capitalization	Estimated value of total farm capital			
		Land class II	Land class III	Land class IV	Land class V
Labour income	4.02	−$ 99	$ 7,463	$20,597	$53,706
Returns to capital	5.49	− 1,056	8,542	22,186	55,556
Labour expenses	4.55	3,253	9,560	19,538	24,330
Labour returns per worker	3.57	2,689	10,308	17,199	30,504
Capital and labour returns per man	4.03	3,151	10,149	16,452	28,586
Farmers' estimates, total farm capital		$3,503	$10,048	$16,072	$26,806

TABLE 5.—ESTIMATES OF TOTAL FARM CAPITAL, OBTAINED BY CAPITALIZING VARIOUS MEASURES OF INCOME, EXPRESSED AS PERCENTAGES OF FARMERS' ESTIMATES OF TOTAL FARM CAPITAL, IN DIFFERENT LAND CLASSES, FREDERICK COUNTY, MARYLAND, 1938

Measures of farming returns	Estimated capital, in per cent of farmers' own estimates				Average variation from 100%
	Land class II	Land class III	Land class IV	Land class V	
	%	%	%	%	%
Labour income	− 2.8	74.3	128.2	200.4	64.3
Returns to capital	−30.1	85.0	138.0	207.3	72.6
Labour expenses	92.9	95.1	121.6	90.8	10.7
Labour returns per worker	76.8	102.6	107.0	113.8	11.6
Capital and labour returns per man	90.0	101.0	102.4	106.6	5.0

A study of the relation of economic land classes to farm businesses and farm loans in Frederick County, Maryland, is being made by research divisions of the Farm Credit Administration. In four grades of farm land areas, ranging upwards in economic productivity from land class II to land class V, the *returns per man* varied from grade to grade in a closer relation to farm capital than did any other measure of net income (Tables 3, 4, and 5). The measure of net income which showed the least regular

relation to total capital was *returns to capital.* This measure was derived by the usual subtraction method, whereby actual farm wages and a valuation of the operator's time are deducted from the total dividend available for labour, management, and ownership, leaving as a residual the *returns to capital.* In this instance, the operator's labour was valued at hired men's wages for the same land class. The comparison indicates how unrealistic is the assumption that the return to the essential function of ownership should be a residual, rather than a share.

TABLE 6.—NET FARMING RETURNS, IN DIFFERENT LAND CLASSES, NEWFANE-OLCOTT AREA AVERAGE 1913-1937

Land class	Labour income	Returns to capital	Total labour expenses	Labour expense per hired worker	Labour returns per worker	Capital and labour returns per man
III	−$ 43	−$ 233	$ 322	$ 644	$ 187	$ 272
IV	110	102	467	667	315	421
V	394	662	837	761	537	647
VI	564	1,262	1,370	806	623	801

TABLE 7.—VARIOUS MEASURES OF NET FARMING RETURNS EXPRESSED AS PERCENTAGE OF TOTAL FARM CAPITAL, NEWFANE-OLCOTT AREA, AVERAGE 1913-1937

Land class	Labour income	Returns to capital	Total labour expenses	Labour expense per hired worker	Labour returns per worker	Capital and labour returns per man
III	−0.51	−2.74	3.79	7.58	2.20	3.20
IV	0.90	0.84	3.83	5.47	2.58	3.45
V	2.21	3.72	4.71	4.28	3.02	3.64
VI	2.15	4.80	5.21	3.07	2.37	3.05
Arithmetic average	1.19	1.66	4.38	5.10	2.54	3.34

TABLE 8.—AVERAGE TOTAL FARM CAPITAL AND VARIOUS MEASURES OF NET FARMING RETURNS CAPITALIZED AT THEIR AVERAGE PERCENTAGE OF FARM CAPITAL, NEWFANE-OLCOTT AREA, AVERAGE 1913–1937

Land class	Average farm capital	Returns capitalized					
		Labour income	Returns to capital	Total labour expenses	Labour expense per hired worker	Labour returns per worker	Capital and labour returns per man
		Rate of capitalization					
		1.19	1.66	4.38	5.10	2.54	3.34
III	$ 8,497	−$ 3,613	−$14,036	$ 7,352	$12,627	$ 7,362	$ 8,144
IV	12,197	9,244	6,145	10,662	13,078	12,402	12,605
V	17,789	33,109	39,880	19,110	14,922	21,142	19,371
VI	26,283	47,395	76,024	31,279	15,804	24,528	23,982

In another study, the Economic and Credit Research Division of the Farm Credit Administration is investigating income and capital relationships in different land classes in the so-called Newfane-Olcott fruit-growing area in Niagara County, New York. Professor G. P. Scoville has taken

TABLE 9.—VARIOUS MEASURES OF CAPITALIZED NET RETURNS EXPRESSED AS PERCENTAGE OF TOTAL FARM CAPITAL, NEWFANE-OLCOTT AREA, AVERAGE 1913–1937

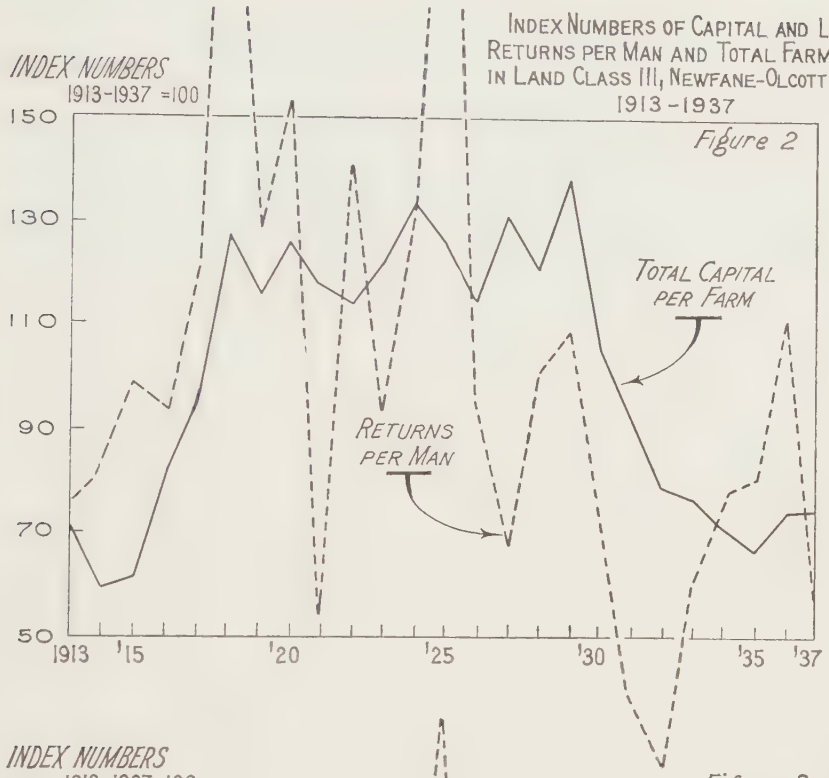
Land class	Labour income	Returns to capital	Total labour expenses	Labour expense per hired worker	Labour returns per worker	Capital and labour returns per man
III	− 43	−165	87	149	87	96
IV	76	50	87	107	102	103
V	186	224	107	84	119	109
VI	180	289	119	60	93	91
Average variation from 100	83.2	157.0	13.0	28.0	10.2	6.2

TABLE 10.—NUMBER OF FARM BUSINESS RECORDS STUDIED IN EACH LAND CLASS IN EACH YEAR, NEWFANE-OLCOTT AREA, 1913–1937

Year	Number of farm records				
	Land class III	Land class IV	Land class V	Land class VI	Total
1913	3	45	15	20	83
1914	4	58	11	21	94
1915	3	39	15	20	77
1916	3	55	12	14	84
1917	7	72	15	15	109
1918	18	87	17	27	149
1919	26	79	18	29	152
1920	22	84	27	33	166
1921	25	80	27	31	163
1922	22	95	26	29	172
1923	32	99	30	30	191
1924	32	95	29	42	198
1925	23	84	28	34	169
1926	27	82	32	37	178
1927	23	80	28	33	164
1928	17	72	24	26	139
1929	20	74	26	31	151
1930	21	60	24	25	130
1931	18	72	28	27	145
1932	14	65	28	29	136
1933	8	56	22	21	107
1934	8	65	22	26	121
1935	10	61	25	26	122
1936	7	48	25	23	103
1937	7	54	23	24	108
Total	400	1,761	577	673	3,411

Fig. 2.—Returns per man fluctuated much more violently than the value of farm capital, and rose and declined in advance of capital, in land class III.

Fig. 3.—Capital followed returns per man more closely in land class IV than in III. In 1937, capital was in adjustment with returns.



INDEX NUMBERS OF CAPITAL AND LABOUR RETURNS PER MAN AND TOTAL FARM CAPITAL IN LAND CLASS III, NEWFANE-OLCOTT AREA, 1913 – 1937

Figure 2

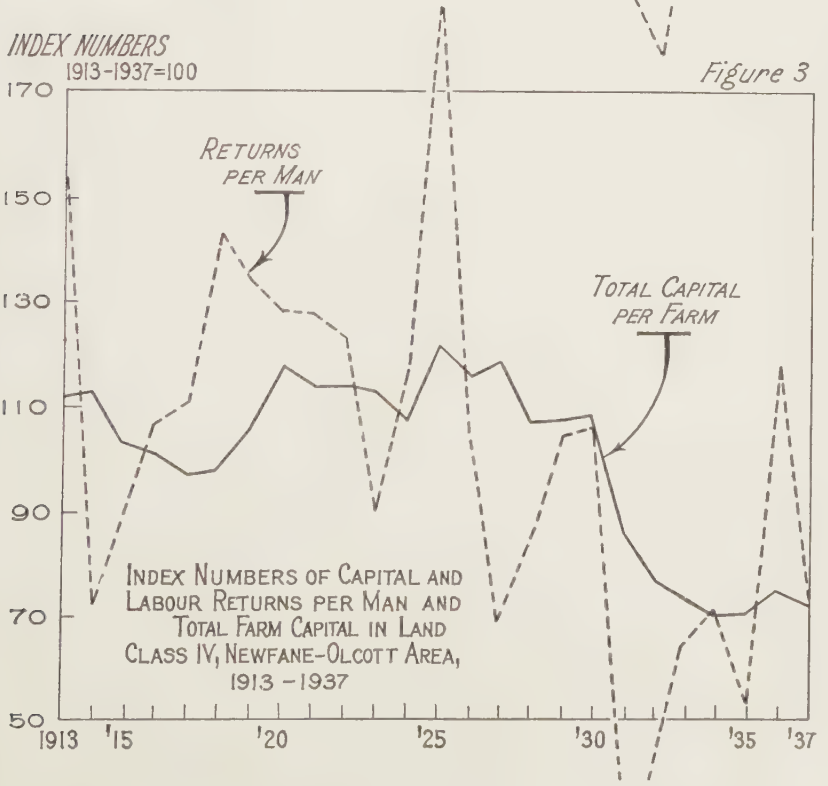


Figure 3

farm survey records in this area every year since 1913. These valuable data, covering a 25-year period, together with a land class map made in 1938, are the basis for the present study.

The 25-year averages of measures of net income and of capital were obtained by averaging the 25 annual averages. These averages indicated that *returns per man* were the best measure of differences in productivity as they affected total farm capital (Tables 6, 7, and 8 and 9.) They also showed that *returns to capital*, calculated as the usual residual, had the least regular relation to capital. In this instance, the assumed value of the operator's labour was the same in every land class, but varied from year to year as hired men's wages changed.

In attempting to explain what they considered to be the "over-valuation of poor farms and under-valuation of good farms" with respect to the residual, *returns to capital*, some have suggested that poor farms are overbid and good farms are underbid because so many more people have the price of a poor farm than have the price of a good one. However, if all farms were good, all farmers would have the price of a good farm; and if all farms were poor, nobody would have the price of a good farm. In other words, the grade of the supply of farms is necessarily distributed in the same ratio as is the grade of the demand for them, and the latter is therefore no explanation of price differences between one grade of farm and another.

Except in the earliest and latest years in land class III, annual data for each land class in the Newfane-Olcott area were numerous enough to furnish a basis for studying 25-year trends (Table 10). Comparison of trends in *returns per man* and in *total farm capital* indicated that returns per man fluctuated from year to year with much the greater violence (Figures 2, 3, 4, and 5). In the lower land classes, the general movement in returns per man also anticipated movements in the value of capital, but the two movements were contemporary in the higher land classes. Generally speaking, changes in the value of farm capital followed or were contemporary with similar changes in returns per man.[1]

In connection with the Frederick County data as well as the 25-year averages for the Newfane-Olcutt area, it might have been remarked that the average annual wage of hired workers increased considerably as the grade of land rose. The wage figure includes all labour performed, whether paid by the piece, the day, or the month.

Although contract relations between operators and wage hands are not perfectly flexible, even wages bend noticeably before the ultimate fact that the reimbursement of all workers must come from the production of the farm on which they are employed. Mobility of labour can assure only that if a man does move to a higher grade of farm, his earnings will increase; but as long as he actually remains on the lower grade he cannot earn much more than the available resources will allow, even temporarily. He who wonders why people do not all move to the best land needs only reflect that if such a movement were carried to its logical conclusion, there would be room for only one man on all the earth!

[1] Further analysis of these data, accomplished after this paper had been written, has indicated that total farm capital in a given year tended to be in proportion to a geometric average of labour and capital returns per man in the given and five preceding years.

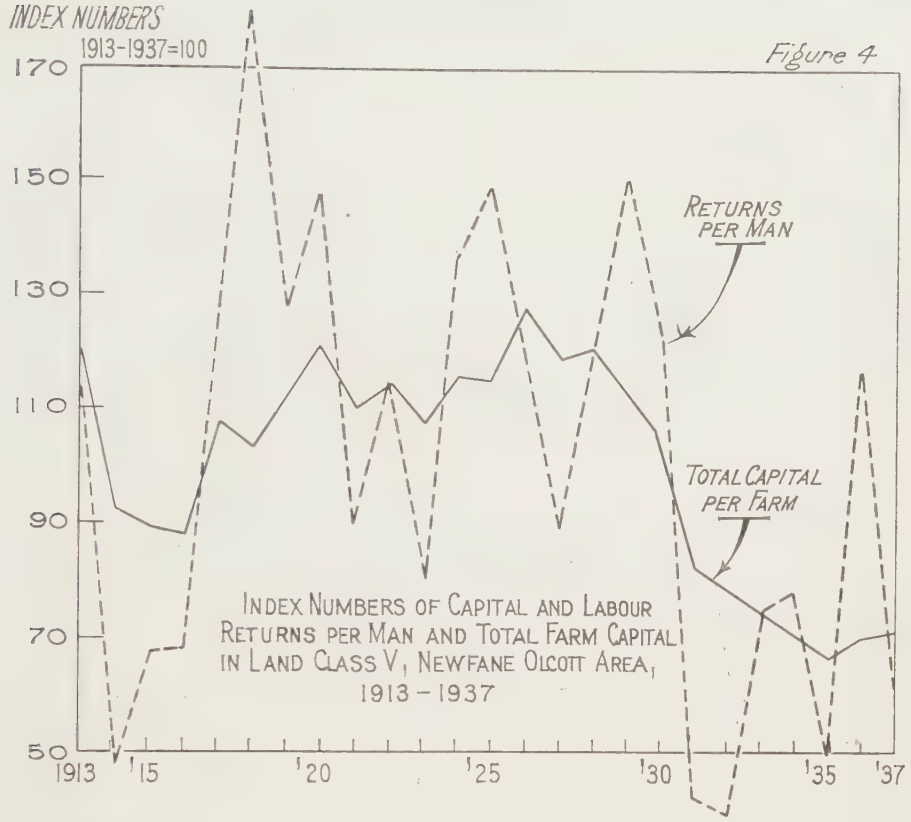


Figure 4

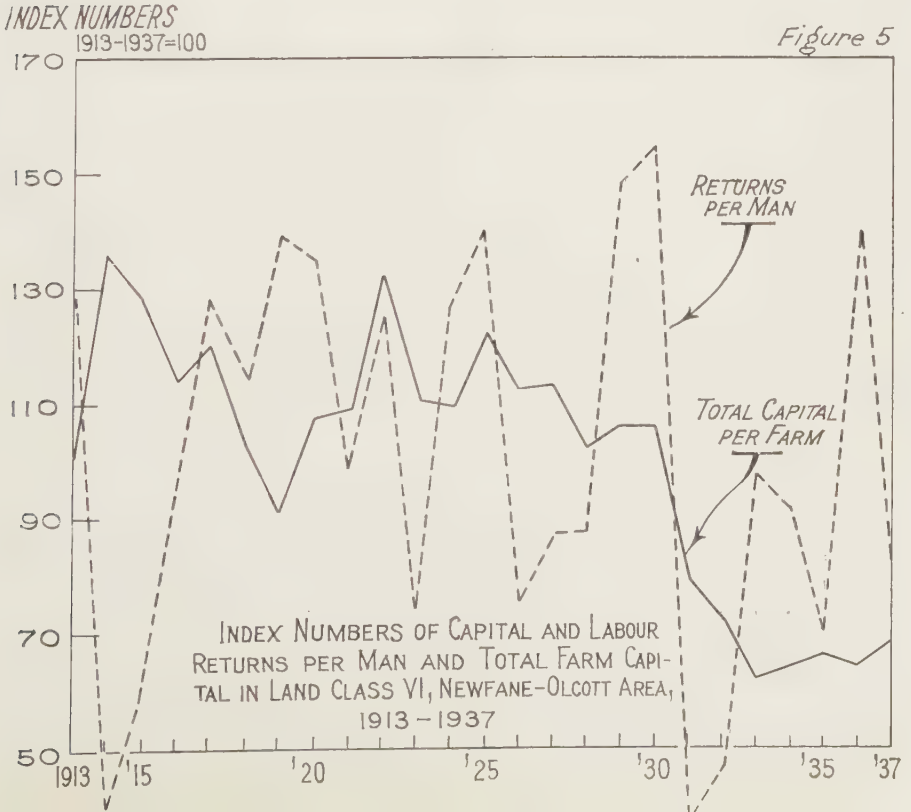
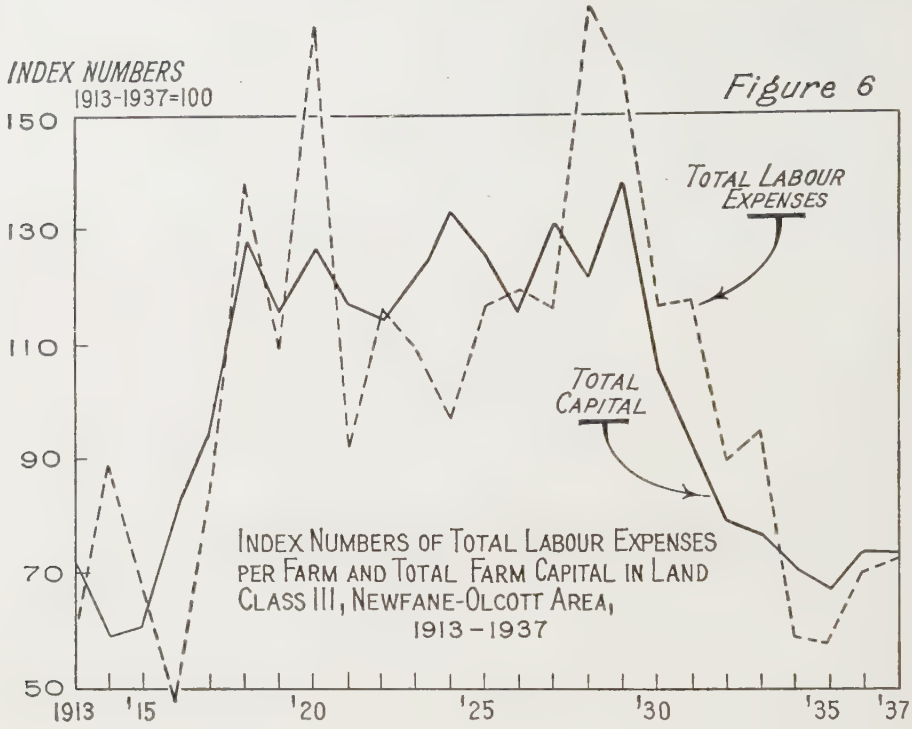
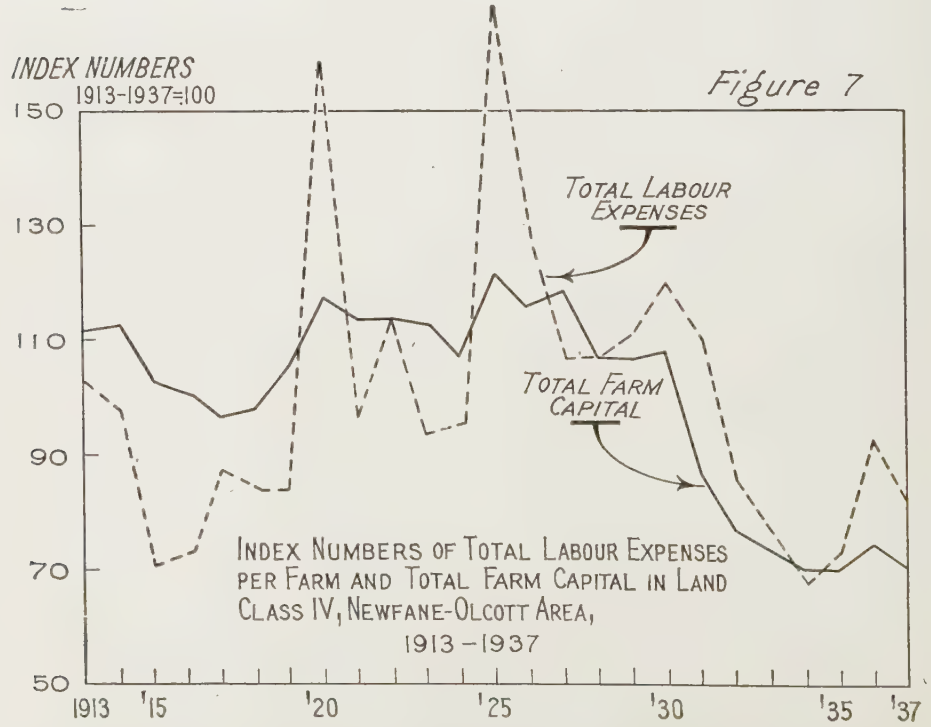


Figure 5





Although labour expenses per farm varied more from year to year than did total farm capital, the two followed closely similar trends throughout the 25-year period in all land classes. (Compare figures 6, 7, 8, and 9.)

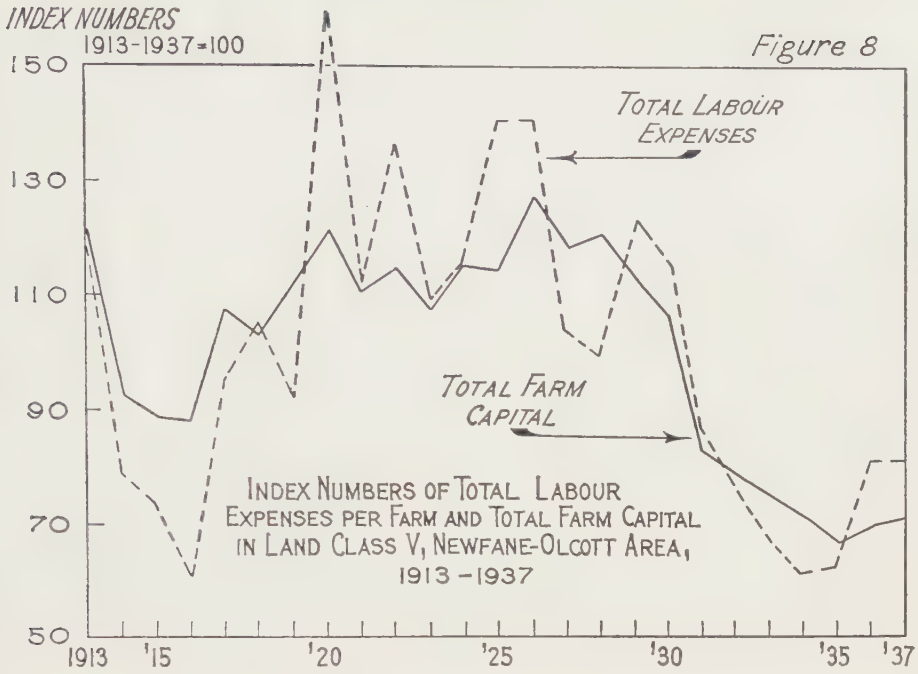


Figure 8

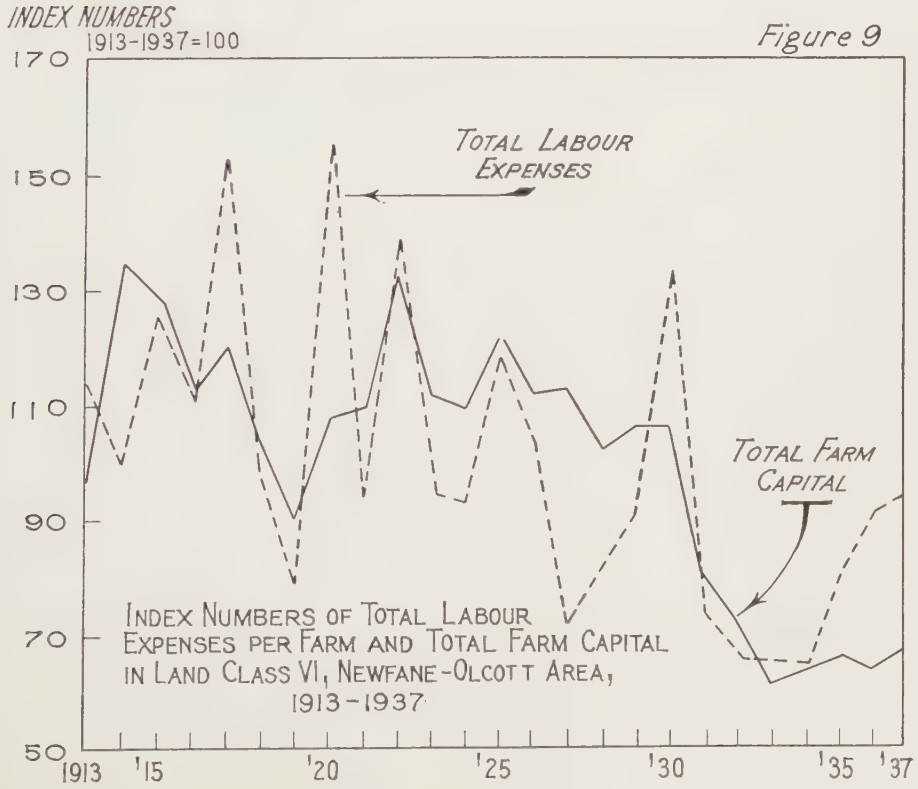
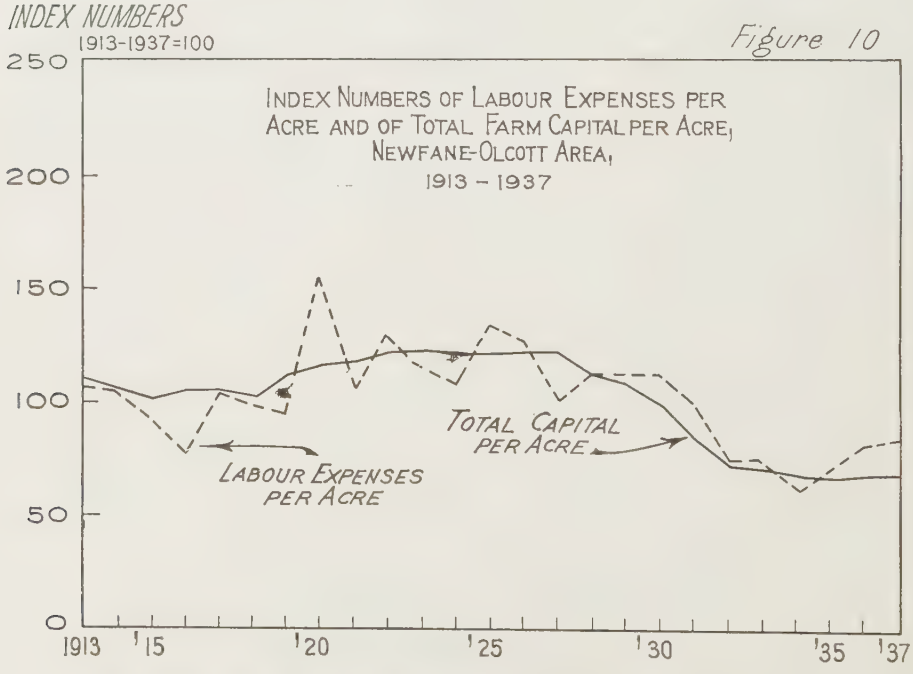


Figure 9

What inflexibility, as between land classes, may remain in the average wage rate for all labour performed on the farm tends to be offset by varying the amount and type of labour hired, so that the total labour expenses per farm have a tendency to vary from one grade of land to another in the same ratio as does the capital. Although this relation was not so close as that between *returns per man* and total capital, the year-to-year trend in total labour expenses per farm was almost identical with that of total farm capital, in every land class (Figures 6, 7, 8, and 9). A remarkable similarity was observed when the average trend of the value of total farm capital per acre was compared with the average trend of total labour expenses per acre (Figure 10). Labourers, as well as farm operators and owners of farm capital, cannot escape the consequences of local differences in the productivity of land, nor of changes from time to time in the productivity of all grades. Again, the data illustrate the unreasonableness of assuming a standard rate for labour and calculating a residual return on capital.

In the Newfane-Olcott area, fruit farming is the chief business in every land class. Under these conditions, the trend in the value of total farm capital per acre was the same in all land classes (Figures 11 and 12. Values were expressed on an acre basis to eliminate fluctuations in size of farm, which were dissimilar as between land classes). This similarity of trend is reasonable. A farm is an integrated whole, a product of the factors



(Simple annual averages of index numbers for land classes III, IV, V, and VI.) 1913-1937 = 100.

Total capital and total labour expenses per acre followed the same trend throughout the period 1913 to 1937.

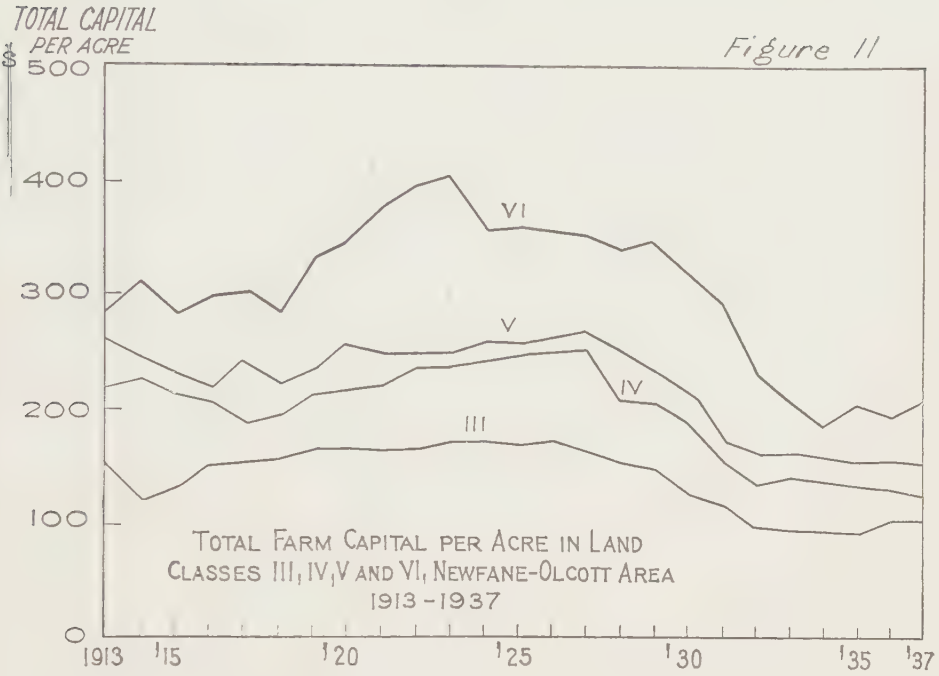


Figure 11

Economic land classes, mapped in 1938, differed in respect to capital per acre in a constant manner throughout the period 1913 to 1937.

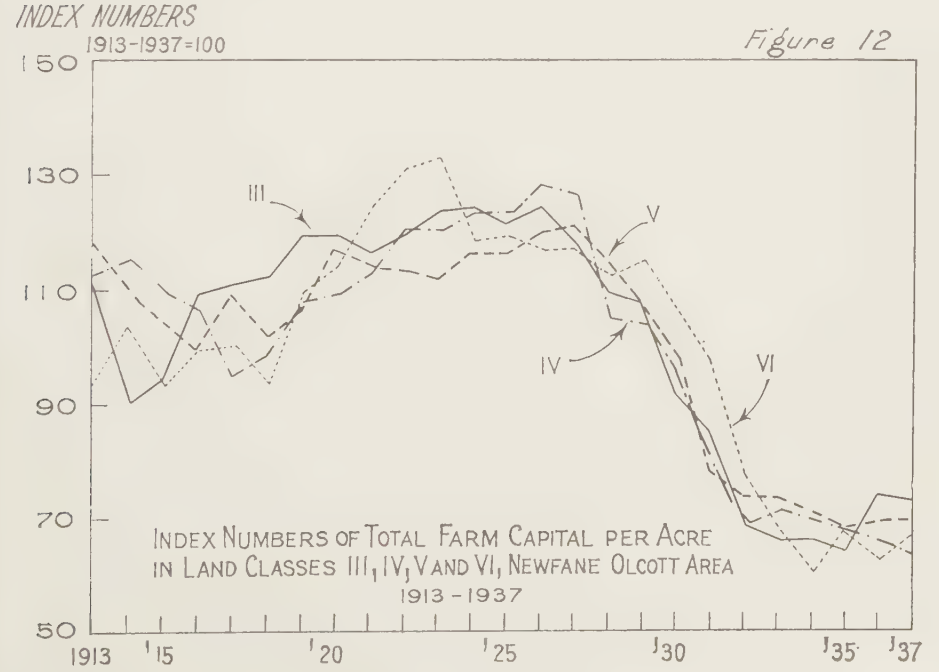


Figure 12

The trend in land values was the same on all grades of farm land.

which produce value. When a factor common to all grades of land, such as climate or the price of apples, rises or falls, it necessarily affects the value of each grade by a percentage of its former value.

In this paper, only the relation of productivity to value has been treated. Within each productivity class, other factors, such as the size of the farm, have been found to cause variation in the relation of net income to value. Other newly available data relate to factors affecting income. Interesting observations have also been made on the relation between gross income and value.

No field in which agricultural economists may work will be more fruitful of results than that of statistical research in land economics, based on economic land class maps and farm management data. Studies should be made in all type-of-farming regions. Based on much further research of this character, there will finally be built a complete structure of valuation theory.

Definition of Terms

1. Number of workers:	The operator plus paid and unpaid labourers.
2. Number of men:	Number of workers, plus one to represent the landlord or owner of capital.
3. Total farm capital:	Farmers' estimates of the value of land, buildings, live stock, equipment, and supplies.
4. Labour returns per worker:	Total farm receipts minus farm expenses (except for labour), minus 5% of the total farm capital, divided by the number of workers.
5. Labour and capital returns per man:	Total farm receipts minus farm expenses (except for labour), divided by the number of men.
6. Labour expenses per hired worker:	Total expenses for labour, including a charge for unpaid labour but not the operator's labour, divided by the number of paid and unpaid labourers, excluding the operator.
7. Labour income:	Total farm receipts minus farm expenses, minus 5% of the total farm capital.
8. Returns to capital:	Total farm receipts minus farm expenses, minus an allowance for the value of the operator's labour.

THE ECONOMICS OF FOREST RESTORATION IN THE U.S.[1]

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Forest restoration in the United States needs badly to move ahead from its present fragmentary, restricted, and all but superficial stage, into a stage of comprehensiveness. The step is proving a difficult one to make. Private initiative appears largely helpless and the government is hesitating chiefly, it appears, because (1) of the great pressure of other problems to which the need for a great defense program has recently been added and (2) because of the lack of agreement on just what to do.

The need for restoration is hardly at all questioned now. Writers and editors are finding it necessary to devote less time and space to the "horrible example" illustrations of forest devastation and waste and to the expansion of the literature of the "economics of past mistakes." The presentation of action proposals is definitely "on stage." A plaintive cry still goes up from the occasional forester who wishes "to give existing programs a fair trial"; that is, from those who wish to perpetuate the "bow and arrow stage" of forest policy. On the whole, however, the drive to enlarge the scope and power of restoration programs is unmistakable. A congressional committee has been formed to consider needed additional federal legislation. Hearings have been held by this committee in various parts of the country and one bill, "The Cooperative Forest Restoration Bill", has been devised and given some consideration both by the committee and the forestry public of the country. Apparently the final committee report is still forthcoming and much is hoped for in its appearance.

In the final program that is evolved a number of matters of economic and public policy will have to be considered and resolved in one manner or another. Of these problems the discussion here will be centered about a few only. These will include consideration of (1) the nature of the financing program that will have to be provided, (2) the adequacy of the program devised and the speed at which it should be carried into effect, (3) the associated problems of public policy touching other fields, and (4) the problems of management and ownership co-ordination.

THE NATURE OF THE FINANCING PROGRAM

The nature of the financing program to select presents a whole complex of problems in itself. One major division of opinion occurs in connection with the matter of extending public ownership involving, of course, the dependence upon public finance. Various recommendations regarding the broad division between public and private ownership that will ultimately be desirable have been made. The United States Forest Service in a recent report recommended that 435,000,000 acres of potential forest land now or recently in private ownership be reduced by 178,000,000 by 1960 and that this amount be added to the 158,000,000 already in public owner-

[1] Read at the Twentieth Annual Convention of the Canadian Society of Technical Agriculturists held at the University of Manitoba, Winnipeg, Man., June 19 to 22, 1940.
[2] Professor of Agricultural Economics.

ship. The total acreage in private ownership at that date (1960) if these recommendations are followed, would be 257,000,000 acres, with 358,000,000 acres in public ownership.[1]

Within this large acreage for which public ownership is favoured there is the further problem of what the division of responsibilities should be as between federal, state, and local governments. With respect to this matter the report referred to recommends a considerable increase in state ownership to a total of 77,000,000 acres in 1960 as compared to about one-fourth that amount now. For county and municipal governments it suggests an acreage of only 5,000,000 in 1960, leaving 270,000,000 acres for the federal government.

Such are, however, only the broad goals of ownership and probably not the most difficult matter involved. The really troublesome problem occurs in connection with the ownership and management of lands that are to remain in private ownership. Management of forest lands, to be economical, requires large and reasonably contiguous tracts. Ownerships even in the wilder and more remote sections of the potential forested areas of the United States, however, are of small tracts held by an indescribable mixture of resident and non-resident owners. In one of the most isolated sections of the Missouri Ozarks, in an area noted chiefly for hills and stones, the average size of ownership tract (over an area of 200,010 acres) was 128.1 acres and the most common ownership was of 40 acres or less.[2] Along the farm-forest border ownerships are even smaller.

This ownership pattern problem has another dimension which adds still further complications, however. These small ownerships are, it may be said, in various stages of decomposition. Taxes are delinquent as often as not. Some tracts have been sold once, twice, or even three times for taxes under laws that do not always grant secure titles. Often the owners have never seen the lands. Sometimes mortgage and judgment claims are outstanding even on such lands, and on the whole the situation is properly referred to as chaotic.

One of the first order necessities in any broad restoration program is to provide a means of creating order in place of this confusion in the land tenure pattern. Purchase for public ownership brings an automatic consolidation into sufficiently large tracts for management. Various schemes to consolidate private ownerships have been prepared. One is that government lease the tracts and provide the management.[3] Still other suggestions call for the formation of forest conservation districts[4] or forest restoration units[5] under formal provisions of law to effect the necessary consolidation. Still another suggestion, vague as yet, proposes informal co-operative organizations of owners for purposes of management[6].

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[1] See, for instance, Table 25, page 209, Report of the National Resources Board. 1934.

[2] See Mussman, A. H. "Forestry: A Modern Investment Frontier." Master Thesis. On file with the Library of the University of Missouri. 1939, p. 28.

[3] See "Extending Public Control and Management of Forest Lands Without Purchase" by the author. Journal of Forestry. January, 1939.

[4] See the author's "A Proposed Forest Restoration Credit Bill," February, 1940. Title I, Chapter II. (mimeographed).

[5] As provided in the Cooperative Forest Restoration Bill.

[6] As set out in the report of the Inter-Bureau (U.S.D.A.) Coordinating Committee on Forest Credit. (mimeographed) April 20, 1940. see p. 32.

SOURCES OF FUNDS

These related difficulties of the ownership pattern and organization for management explain in part why private funds have entered the field of forestry in such meager amounts. There are, however, other reasons for the timidity of the private investor. First, except for those forests already upon an acceptable level of sustained yield, there is the wait for income with the associated uncertainties that probably increase more than proportionately with the lengthening period of deferment. Second, the need to continue tax payments during the waiting period means continuous costs and outlays and growing financial risks till the harvest is available. It is somewhat the fashion lately to laugh off these tax difficulties as being but little different from those faced by other industries. No one has been able yet to laugh away the all too easily read fact, however, that tax delinquencies concentrate heavily on cut-over deforested land. The laugh at tax difficulties remains, therefore, somewhat hollow. Finally, also there is the fact that many forest land owners are absentees and because of that fact unwilling to do much investing in an industry that they cannot manage themselves and with which they are mostly out of touch.

For these and other reasons private funds are most unlikely to flow any more vigorously into restoration investment than they have in the past. As the Copeland report points out, private owners of forest land with 80% of the area and 90% of the potential productive capacity made, recently, only 10% of the constructive expenditures for forest propagation. The public, owning from 10 to 20% of the acreage made, by contrast, 90% of the expenditures[1].

Depending upon unsupported private outlays for forest restoration will, therefore, apparently be impossible if an adequate program is ever to be inaugurated. Dependence upon public outlays entirely, however, leaves much to be desired. Demands upon public treasuries have in the immediate past been unusually heavy and there seems to be no likelihood of a let up in the near future. Getting the money from Congress in competition with the demands for farm subsidies, social security needs, and the rising requests for armaments is going to require extra-ordinarily strong campaigning on the part of foresters. The amounts needed for a comprehensive program have been variously estimated. They range from a very conservative three to four billion to a more realistic six to ten billion dollars.

Congress has, furthermore, often proved most reluctant to make outlays for acquisition of forest lands because such outlays must, of a necessity, be followed in later years by additional and continuing appropriations for maintenance and development. Compared with the support that can always be gotten for farm program and for social security appropriations and the like, forestry must be counted politically weak. Only a few people regard themselves immediately interested financially. Lumbermen, who have been politically strong at one time or another, have become distrusted because of their part in forest devastation. Furthermore, forest restoration is not the country's first conservation problem. It apparently stands below soil conservation and below flood control and water conservation in public

[1] A National Plan for American Forestry—Government Printing Office, 1933, page 76.

esteem. Even wild life conservation, because of the interest and power of sportsmen's groups, can often command more public attention and funds than can forestry. At any rate, I suspect that the handsome uniformed forester attending and speaking before the American Legion, the Veterans of Foreign Wars, Chambers of Commerce, Lions Clubs, Kiwanis Clubs, the Rotary International, Farmers' Organizations, Leagues of Women Voters and the D.A.R. is going to have to become an even more familiar spectacle if public finance is going to carry the whole load of restoration.

Government alone in the field would be unwise for certain further reasons. Too much government domination in the field would lead to increased cries of regimentation. The matter is, perhaps, not too serious but political irritations are worth avoiding if not too much else is lost. In this case, it appears to me, some effort to continue a considerable amount of private ownership in order to provide a profit motive efficiency yardstick by which to judge government operation may prove well worth while. Finally, also, there is much need to reserve the financial power of government for the purchase and management of those areas where the profit prospect is too poor to attract the private investor but which, because of the need for watershed protection, flood control, wild life conservation, or recreational development, stand strongly in need of management.

ASSOCIATED PROBLEMS OF PUBLIC POLICY

Before going on to the consideration of ways and means of financing a comprehensive restoration program and of maintaining a large private interest in timber production there are certain items of associated public policy that deserve mention. These aspects of the matter are important for the light they throw on the need for public concern in the program.

Farmers, as one large section of the public, have a great concern with the restoration program. With shrinking foreign markets many believe that the acreage of farm lands in the United States should be reduced. Such reduction should certainly be made along the poor-land margin and often in the United States that means along the farm-forest margin. Shrinking farm production by an attack along the poor land-margin would be doing it the hard way. It has been estimated that 50% of the farmers of the country on the poorest and smallest farms contribute only 11% of the agricultural produce reaching commercial channels. To accomplish much, therefore, there must be a lot of shrinking done and to date progress has been slow.

Doing away with or mitigating the hazards that now so sharply limit private investment in forestry will facilitate this program of returning such farm lands to timber production. So poor has been the prospect for profitable employment of capital and labour for forestry under past circumstances, however, that farmers even on the poorest land have, on the whole, not thought of forestry as a serious competitor of crops and pasture for the use of their lands. It does not appear at all impossible to rectify this situation so that trees can crowd onto far greater acreages of farmer-owned land than heretofore.

However, forest restoration is important to the farmer and to others living in cut-over and deforested areas in another and, on the whole, much more important manner. That is, forest restoration is important to agriculture because of its significance in a broad scale attack on rural poverty. Forest restoration is going to require forest investment upon a truly huge scale as I have indicated above. This investment, furthermore, will take place in areas too long neglected from a developmental viewpoint and in which isolation, ignorance, and poverty have long been characteristic. In both Canada and the United States urban and industrial areas have for many decades been looked upon as the prosperous sections of the country. Poverty more often chooses a rural residence and, indeed, rural poverty in the United States has been revealed recently to be most shocking in extent[1]. While there are many contributory causes, one of the reasons for the great wealth and high living planes of industrial areas, and small wealth and low planes of the deforested areas is because so much investment is continuously taking place in the former and so little in the latter. Forestry is a modern investment frontier. Relieving it of the shackles that have held it down in the past will aid in opening up a copious flow of funds to these deforested areas and help relieve their underdevelopment, their unemployment, and reduce their poverty[2].

The farm program of the United States has been designed so far to help chiefly the commercial farmer. The great exception is the program of the Farm Security Administration. More recently the policy makers have been suggesting a great rural works program. The opportunities provided by forest restoration would fit in neatly with such a works program.

FOREST RESTORATION AND LOCAL GOVERNMENT

Forest devastation has made local governments as well as local people poor. There is no need here to enter into the long tale of the nature and extent of tax delinquency in cut-over land areas. Perhaps it is worth while noting, however, that fiscal conditions of local governments in deforested areas not unseldom approach that of bankruptcy, and that there is no relief in sight unless indeed that relief is to be found in a program of forest investment and restoration.

One county of Missouri in which we have been particularly interested illustrates the situation excellently. This county issued $60,000 worth of bonds in 1931 to pay off that amount of unpaid current bills. Five years later the accumulated unpaid bills were again approaching $50,000 and in the meantime only $10,000 of the bonds had been paid off. As it stands at present this county has a total debt of $175,000 and is running behind at a rate of not less than $5,000 a year.

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[1] See particularly the recent writings of C. C. Taylor, O. E. Baker, Conrad Taueber and others. More recently M. L. Wilson has discussed the "Problem of Poverty in Agriculture." Journal of Farm Economics, Proceedings No. Feb. 1940.

[2] Secretary Wallace in his statement before the Joint Committee of Congress on Forest Lands makes a statement that may be interpreted in the same vein as the above . . . . ."Yet as I Travel South and West and North, I am indelibly impressed with this fact: Although forests are living things, and can be cropped, we are still exploiting them. Forest communities, once the timber is cut, are left desolate and forlorn; too seldom is a forest used as a permanent resource capable of supporting a permanent community. We still denude our watersheds and cause fertile valleys and industrial cities to suffer, year after year, from erosions and floods.

"The forest, unlike a mineral, is a renewable resource. Man can grow forests. He can, if he will, provide forest industries with continuous supplies of basic raw material and keep labor continuously employed. Yet less than 35 per cent of our forest land now bears trees big enough for saw timber. More than one-third of our remaining saw timber forests are economically unavailable. Annual growth in usable saw timber forests is one-half less than the annual drain from them."

Mostly the difficulties of the county arise out of tax delinquency on forest lands and the problem is how to return such lands to a tax paying status. Hopefully enough there are 400,000 acres of lands in the county now virtually unused, and returning them to a high level of timber products production and tax paying ability would put the county back on its fiscal uppers.

Part of the land in the county is already in federal ownership as a part of a National Forest. Unfortunately federal ownership means that the land is removed from the local tax roll. Federal law provides that 35% of the gross receipts from National Forest lands shall be returned to the locality to be used for schools and roads, but the difficulty is that these receipts are sure to be small until a significant amount of timber can again be harvested. In other words such receipts will be small for a long period. Federal ownership may be a good long run solution, but in the short run it increases rather than decreases the county's problems. There are two ways out of this particular difficulty. One is to have the government make immediate rather than delayed payments. Proposals to this effect are now being considered in Congress. The second is to provide the means to enable the present owners of the land to inaugurate a system of forest management and production so that they would again consider it worth while to pay the taxes. This matter is also being considered.

If fiscal problems of this nature troubled only a single county the matter would be insignificant. They are, however, troubling virtually all counties in which forests have been cut-over and the lands left unmanaged and unproductive. Perhaps 35 counties in Missouri are already affected, and the area in Minnesota, Wisconsin, and Michigan, respectively can hardly be much less. The same problems are encountered in much of the Appalachian highland region, in Rocky Mountain and Pacific states. That is, they are encountered in virtually all states. The continued fiscal health of hundreds of local governments is, therefore, closely associated with forest restoration.

The benefits that a comprehensive restoration would confer in terms of protection, control of floods, wild life restoration and the improvement of recreation need only a brief recalling. They are all important benefits and they all accrue more to the public at large than to the individual owners of private lands. The point is significant because, while the private owner cannot take them into account in casting up costs and profits, the public can give them great weight in its determination of the extent to which it can gainfully subsidize forest restoration.

There are, however, two much more immediate reasons why the government can afford to encourage and subsidize restoration. First, there is the matter of making investments in restoration substitute for relief expenditures. Cut-over areas where restoration would be accomplished are so often poverty areas and poverty areas are relief areas. In the deforested counties of the Missouri Ozarks the percentage of families on relief has run persistently from 20 to 50% for half the years of the decade of the thirties.[1] Relief in such areas arises in large part because of the depletion

[1] As revealed by the data contained in the volumes of the "Index of Public Assistance in Missouri". Published by State Social Security Commission.

of resources. It is, therefore, a stubborn thing likely to last a long time. There have not been too many really constructive ways of employing local unemployed (relief) labour in these counties. There have been unfortunate epidemics of road building in some counties where roads were not needed and where the tragic need has been forest restoration. But public monies cannot be spent on private lands, and so far the restoration program has not proceeded sufficiently far to provide the needed outlet for such expenditures. In the rural works program now being projected such provision should certainly be made.

As a second point, there is the great need to find a place to use the country's savings, that is, to open investment outlets. As economists are well aware, the decade of the thirties has proved to be one of weak private investment. From 1919 to 1929 the average annual investment in plant and other durable goods construction was 19 billion dollars. From 1930 to 1938 it was only 12 billion. Government investment and spending have been stepped up partially to fill the gap but interest rates have fallen, nevertheless, to unprecedentedly low levels. When it is recalled that forest restoration is largely a matter of forest investment these facts are of utmost importance. Idle money, idle men, and idle forests constitute the tri-cornered challenge of those who are charged with the formulation of forest policy in the United States to-day.

THE NATURE OF SPECIFIC PROPOSALS

Against the background of the preceding discussion there may now, as a final consideration, be taken up the specific proposals that have been made to date. I shall limit myself to comments on three of these.

The first of these is the Cooperative Forest Restoration Bill introduced in the 75th Congress as H. R. 7271 and S. 2927. The bill has been revised since, and in the 76th Congress one of these revisions was introduced by Congressman Fulmer.

In brief the bill provides that the Federal government may lease potential forest lands from their owners and turn them over to the Forest Service for management. For the lease the government is to pay a tax rental equal to the "average annual taxes assessed upon such lands during the five year period immediately preceding the signing of the lease." At the end of the period, government, it is provided, shall be reimbursed for all its costs from the sale of forest products from the land except that owners leasing not more than 500 acres need only repay to the government 50% of its outlays.[1] The program was meant to be particularly attractive to farmers and small owners, and state and local committees set up for its administration were designed to give a preponderance of representation to farmers or officials of farmer institutions.

The bill gained proponents as well as opponents but has been rather roundly criticized. Various points against the bill have been made, among them (1) that the magnitude of the proposed program was not in keeping with the task to be accomplished, (2) that the tax rentals were not well designed, (3) that hidden and probably large subsidies granted upon the

[1] Mr. Fulmer's new bill called for the repayment of all tax rentals plus the 50% of all other outlays of government.

basis of the accidents of ownership were involved, and (4) that control over the program was given over to quasi-public committees with a heavy sprinkling of farmers rather than to those directly interested in efficient and profitable forest restoration.

The two other specific proposals deal with the providing of credit for forest restoration. The first is a proposal of my own embodied in a "Forest Restoration Credit Bill" and the second is that outlined in the report of the Inter-Bureau Coordinating Committee (of the Department of Agriculture) on forest credit. These two credit proposals present a sharp contrast.

The Inter-Bureau Coordinating Committee wishes to inaugurate the program with the extremest caution and only upon a so-called "sound" basis. That is, money is to be loaned only in a rigidly business-like manner. They suggest a central forest credit institution sponsored by the Federal government and organized as a part of the established Farm Credit Administration. The central agency would sell debentures upon the central money market and forest credit banks would retail the credit to borrowers. All borrowers would be required to carry insurance on their properties.

Virtually no concessions to what may be called the social aspects of forest restoration are to be found in the proposals of the inter-bureau committee. No subsidies of any kind are suggested or provided and no formal method of organizing small owners for the consolidation of tracts for purposes of management is offered. However, the suggestion is made that co-operatives be formed perhaps under state laws. No provisions are included for loans to counties, townships, states, or municipalities for restoration purposes. Rather loans are limited to individuals, groups of individuals organized co-operatively, and to corporations.

Indeed loans are to be made only to the established operator and are not to be broadly available for purposes of re-establishing forestry. The extreme caution of the proposal can perhaps best be determined by the fact that loans are to be limited to 30% of appraised value of land and timber, for no longer than 40 years, on tracts that are already upon a sustained yield basis and at interest rates of approximately 5%. The conservatism of these suggested provisions stands in contrast to the credit activities of other parts of the New Deal program. For instance, the Federal Land Bank loans are now available at 4% and on a basis of 50% of the value of the land plus 20% of the value of improvements. Tenant purchase loans, administered by the Farm Security Administration, are made at a 3% interest rate, upon a 40-year basis, and virtually no security other than that the client must own his operating equipment. Under its standard rehabilitation loans the Farm Security Administration lends upon the basis of very slender security and provides close supervison of the clients farming operations. In the field of home loans the Federal Housing Authority will guarantee loans to a maximum 90% of the appraised value of the property.[1]

[1] Secretary Wallace in a recent speech at St. Paul, Minn., made certain statements that are pertinent in this connection. He said in part; "I want to see all the borrowers in the land bank system get the benefit of a rate at least as low as 3½ per cent . . . This can be done by government guarantee of land bank bonds . . We are making in the Department of Agriculture commodity credit loans at 3 per cent, tenant purchase loans at 3 per cent, and rural electrification loans at less than 3 per cent." See p. 10 of the mimeographed copy of the talk, "The Plan of Farm Credit in the National Farm Program."

In my own proposal there is also provided a central federally-sponsored credit institution to be given immediate authority to issue and sell, in the central money market, debentures with a full federal guarantee with respect to both interest and principal. Borrowers would receive these loans from regional forest credit banks. Four types of loans are provided. The first type is to be made to small tract owners organized into Forest Conservation Associations under specific provisions of the bill. Management is provided to these Association lands and forests by the United States Forest Service which is given complete control of all funds loaned. Loans are for all management and development costs. The owners supply only the lands and existing stand. Loans are for a maximum of 60 years and are to be repaid from the proceeds of the harvest of the forests.

Loans upon a somewhat different basis are provided to farm forest land owners, and to states, counties, municipalities and to large private operators able to provide their own forest management. Government is to recognize its responsibility in the field by granting loans on a cost basis until the forests are restored to a sustained yield basis. Thereafter, a 1% charge is made for the operation of the credit system. Furthermore, to re-establish immediately the taxpaying power of these forest lands, tax loans are provided for all classes of borrowers. The fate of so many local governments hangs in the balance that this last provision is important.

Obviously my proposal goes much further in its recognition of public responsibilities than that of the Inter-Bureau Coordinating Committee. Its credit provisions are furthermore much more liberal. Perhaps I have gone too far but, in the light of the realities of the restoration situation, I find it difficult to believe that a comprehensive program can be established by other than very strong measures. I had no desire to suggest the use of a bow and arrow where heavy artillery is needed and available.

THE ANNUAL BUSINESS MEETING OF THE CANADIAN AGRICULTURAL ECONOMICS SOCIETY

The Twelfth Annual Business Meeting of the Canadian Agricultural Economics Society was held at the University of Manitoba, Friday, June 21, 1940, at 1 p.m. Professor E. C. Hope of the University of Saskatchewan, President of the Society, was in the chair. Mr. J. Coke reminded the meeting that this gathering marked the anniversary of the first meeting of the Society which was held in the city of Winnipeg in 1928.

The Minutes of the Eleventh Annual Meeting were read by the Secretary-Treasurer and adopted on a motion by Mr. J. Coke and Mr. Andrew Stewart. The Secretary-Treasurer presented the following financial report for the year 1939–40:

THE CANADIAN AGRICULTURAL ECONOMICS SOCIETY

RECEIPTS AND DISBURSEMENTS FOR THE PERIOD JUNE 7, 1939, TO JUNE 11, 1940

Cash in Bank, June 7, 1939.		$172.89	Stamps		$ 4.40
Fees, 1939–40	$52.00		Editing		5.00
Fees, 1940–41	4.00		Stenographer		5.00
Sales of Proceedings	2.00		Exchange		0.36
Interest	0.96				$ 14.76
		58.96	Cash in Bank, June 11, 1940.		217.09
		$231.85			$231.85

W. F. CHOWN
W. C HOPPER
Auditors

CERTIFIED CORRECT,
June 12, 1940.

It was moved by Mr. Coke and seconded by Dr. H. B. Sommerfeld that this report be adopted. This motion carried.

A report by Dr. Booth on the organization and proposed constitution of the Canadian Research Council in the Social Sciences was read to the meeting. It was moved by Mr. Andrew Stewart and seconded by Mr. J. Coke that a copy of Dr. Booth's report be mimeographed and sent to all members before any action was taken.

The new constitution of the Society which had been presented in a report by Mr. T. G. Major to the 1939 Business Meeting was adopted on a motion by Dr. Grant, seconded by Mr. W. D. Porter. The results of the election of officers for the Society year, June 15, 1940 to June 15, 1941, were announced as follows by the Election Teller.

President—W. C. Hopper, Dominion Department of Agriculture, Ottawa.

Vice-President—W. M. Drummond, Ontario Agricultural College, Guelph.

Committee—F. M. Clement, University of British Columbia, Vancouver.
Andrew Stewart, University of Alberta, Edmonton.
C. V. Parker, Dominion Department of Agriculture, Ottawa.
F. W. Walsh, Nova Scotia Department of Agriculture, Halifax.

It was moved by Dr. C. C. Spence and seconded by Dr. Hudson that the report be adopted. Mr. J. B. Rutherford was appointed as Secretary-Treasurer for the year 1940–41. It was moved by Mr. Sol Sinclair and seconded by Dr. Spence that the meeting adjourn. Carried.

Past Presidents of the Society are as follows: J. E. Lattimer, 1929–30, 1930–31; W. Allen, 1931–32, 1932–33; W. V. Longley, 1933–34, 1934–35; H. C. Bois, 1935–36; T. W. Grindley, 1936–37; J. Coke, 1937–38; J. F. Booth, 1938–39; E. C. Hope, 1939–40.